Mr. Alan R. Horner, Owner
Horner Electric
1521 East Washington Street
Indianapolis, Indiana 46201

Re: T097-12555-00301
Significant Permit Modification to:
Part 70 permit No.: T097-7787 -00301

Dear Mr Horner:

Horner Electric was issued a Part 70 permit on June 30, 1999 for an operation of rebuilding electrical industrial apparatus for motors and generators. A letter requesting changes to this permit was received on May 23, 2000. Pursuant to the provisions of 326 IAC 2-7-12 a significant permit modification to this permit is hereby approved as described in the attached Technical Support Document.

(1) The method of compliance for the VOC NESHAP used for the vapor degreaser was changed from a control set (pursuant to 40 CFR 63.463(b)(2)(i)) to an idling emission limit (pursuant to 40 CFR 63.463(b)(ii)).
(2) The control language that had to do with a "superheated vapor system" was removed, thereby relaxing the compliance requirements.
(3) Requirements limiting exhaust ventilation rate were removed. No exhaust ventilation exists above the degreaser. Exhaust ventilation was not required, so compliance requirements were relaxed.
(4) Equipment descriptions and applicable requirements were modified to include a new paint booth (described as emissions unit 17) and equipment descriptions and applicable requirements pertaining to a discontinued paint booth (emissions unit 6) were omitted.
(5) NESHAP requirements for reporting as required by IDEM were modified in section D.1.7 of the original Title V Permit..
(6) Certain formatting, typographical errors, and one date on an equipment description were changed.

All other conditions of the permit shall remain unchanged and in effect. Please attach a copy of this modification and the following revised permit pages to the front of the original permit.

This decision is subject to the Indiana Administrative Orders and Procedures Act - IC 4-21.5-3-5. If you have any questions on this matter, please contact Dana Armstrong at (317) 327-2181.

Sincerely,

Mona A. Salem
Chief Operating Officer
Department of Public Works
Indianapolis, Indiana

Attachments:
(1) Permit Modification Pages
(2) Technical Support Document (TSD)
(3)TSD Addendum

DRA
cc: Matt Mosier, Compliance, ERMD
Mindy Hahn, IDEM OAM

PART 70 OPERATING PERMIT
OFFICE OF AIR MANAGEMENT
and
INDIANAPOLIS ENVIRONMENTAL RESOURCES MANAGEMENT DIVISION

Horner Electric
1521 East Washington Street
Indianapolis, Indiana 46201

(herein known as the Permittee) is hereby authorized to operate subject to the conditions contained herein, the source described in Section A (Source Summary) of this permit.

This permit is issued in accordance with 326 IAC 2 and 40 CFR Part 70 Appendix A and contains the conditions and provisions specified in 326 IAC 2-7 as required by 42 U.S.C. 7401, et. seq. (Clean Air Act as amended by the 1990 Clean Air Act Amendments), 40 CFR Part 70.6, IC 13-15, IC 13-17 and the Code of Indianapolis and Marion County, Chapter 511.

Operation Permit No.: T097-7787 -00301	
Issued by: Janet G. McCabe, Assistant Commissioner Office of Air Management Robert F. Holm, PH.D, Administrator Indianapolis Environmental Resources Management Division	Issuance Date: 6-30-99

Significant Permit Modification No.: 097-12555 -00301	
Issued by: Mona A. Salem Chief Operating Officer Department of Public Works City of Indianapolis	Pages modified: 5, 30, 32, 34, 35, 36, 37 Issuance Date:

SECTION A SOURCE SUMMARY

This permit is based on information requested by the Indiana Department of Environmental Management (IDEM), Office of Air Management (OAM) and The Indianapolis Environmental Resources Management Division (ERMD).The information describing the source contained in conditions A.1 through A.3 is descriptive information and does not constitute enforceable conditions. However, the Permittee should be aware that a physical change or a change in the method of operation that may render this descriptive information obsolete or inaccurate may trigger requirements for the Permittee to obtain additional permits or seek modification of this permit pursuant to 326 IAC 2, or change other applicable requirements presented in the permit application.

A.1 General Information [326 IAC 2-7-4(c)] [326 IAC 2-7-5(15)]

The Permittee owns and operates a stationary manufacturing operation of rebuilding electrical industrial apparatus for motors and generators.

Responsible Official:	Alan R. Horner
Source Address:	1521 East Washington Street, Indianapolis, Indiana 46201
Mailing Address:	1521 East Washington Street, Indianapolis, Indiana 46201
Phone Number:	(317) 639-4261
SIC Code:	3621
County Location:	Marion
County Status:	Attainment for all criteria pollutants
Source Status:	Part 70 Permit Program Minor source, under PSD rule Major source, section 112 of Clean Air Act

A.2 Emission Units and Pollution Control Equipment Summary [326 IAC 2-7-4(c)(3)] [326 IAC 2-7-5(15)]

This stationary source consists of the following emission units and pollution control devices:

(a) One (1) Detrex Batch Vapor Trichloroethylene Degreaser, identified as Emission Unit #4 (EU4), with a solvent/air interface area of greater than 13 feet, exhausting at one (1) vent, identified as vent ID 7, with no control equipment, installed pre-1983.

(b) One (1) Paint Booth, identified as Emission Unit #17 (EU17), equipped with an air atomization spray coating gun, with a maximum capacity of 0.39 gal/hr, using dry filters as control, exhausting at one (1) stack identified as stack #8. Installed after May 23, 2000.

(c) One (1) Small Varnish Dip Tank, identified as emission unit #7 (EU7), maximum capacity of 1.0 lb/hr, exhausting at one (1) vent, identified as vent ID 7, with no control equipment, installed in 1987.

(d) One (1) Large Varnish Dip Tank, identified as emission unit #8 (EU8), maximum capacity of 1.84 lb/hr, exhausting at one (1) vent, identified as vent ID 7, with no control equipment, installed pre-1983.

(e) One (1) Large VPI Dip Tank, identified as emission unit #9 (EU9), maximum capacity of 2.08 lb/hr, not exhausting at a stack/vent, with no control equipment, installed in 1996.

(f) One (1) Small VPI Dip Tank, identified as emission unit #10 (EU10), maximum capacity of 1.0 lb/hr, not exhausting at a stack/vent, with no control equipment, installed in 1996.

A.3 Specifically Regulated Insignificant Activities [326 IAC 2-7-1(21)] [326 IAC 2-7-4(c)] [326 IAC 2-7-5(15)]

This stationary source also includes the following insignificant activities which are specifically

SECTION D.1 FACILITY OPERATION CONDITIONS

Facility Description [326 IAC 2-7-5(15)]

(a) One (1) Detrex Batch Vapor Trichloroethylene Degreaser, identified as Emission Unit #4 (EU4), with a daily solvent consumption rate of 12 gallons of trichloroethylene, and with a solvent/air interface area of greater than 13 feet, exhausting at one (1) vent, identified as vent ID 7, with no control equipment, installed pre-1983.

Emission Limitations and Standards [326 IAC 2-7-5(1)]

D.1.1 General Provisions Relating to HAPs [326 IAC 20-1-1][40 CFR Part 63, Subpart A]

The provisions of 40 CFR Part 63, Subpart A - General Provisions, which are incorporated as 326 IAC 20-1-1, apply to the facility described in this section except when otherwise specified in 40 CFR Part 63, Subpart T.

D.1.2 Halogenated Solvent Cleaning Machine NESHAP [40 CFR Part 63, Subpart T]

This facility is subject to 40 CFR Part 63, Subpart T, (Halogenated Solvent Cleaning Machine NESHAP), which is incorporated by reference as 326 IAC 20-6-1. A copy of the rule is attached.

(a) That pursuant to 40 CFR 63.463(a) & (b), the Permittee shall conform to the following design requirements:

(1) The cleaning machine shall be designed or operated such that it has a reduced room draft as described in 40 CFR63.463(e)(2)(ii).

(2) The Permittee shall demonstrate that the solvent cleaning machine can achieve and maintain an idling emission limit of 0.45 pounds per hour per square foot of solvent/air interface area as determined using the procedures in 40 CFR 63.465(a) and appendix A to 40 CFR 63, Subpart T.

(b) That pursuant to 40 CFR 63.463 (d), the following work and operational practice requirements for the degreasing operation are applicable:

(1) Control air disturbances across the cleaning machine opening(s) by placing cover(s) to the solvent cleaning machine during the idling mode and the downtime mode unless either the solvent has been removed from the machine or maintenance or monitoring is being performed that requires the cover(s) to not be in place.

(2) The parts baskets or the parts being cleaned in the cleaning machine shall not occupy more than 50 percent of the solvent/air interface area unless the parts baskets or parts are introduced at a speed of 0.9 meters per minute (3 feet per minute) or less.

(3) Any spraying operations shall be done within the vapor zone or within a section of the solvent cleaning machine that is not directly exposed to the ambient air.

(4) Parts shall be oriented so that the solvents drains from them freely. Parts having cavities or blind holes shall be tipped or rotated before being removed from any solvent cleaning machine unless an equally effective approach has

feet per minute) or less as described in 40 CFR 63.466(d).

(3) An exceedance has occurred if the requirements of paragraph (c)(2)(B)(i) of this condition have not been met and are not corrected within 15 days of detection. Adjustments or repairs shall be made to the solvent cleaning system or control device to reestablish required levels. The parameters must be remeasured immediately upon adjustment or repair and demonstrated to be within the required limits.

(4) the owner or operator shall report all exceedances and all corrections and adjustments made to avoid an exceedance as specified in 40 CFR63.468.

D.1.3 Degreasing Operations [326 IAC 8-3-6]

Pursuant to 326 IAC 8-3-6 (Open top vapor degreaser operation and control requirements), the owner or operator of an open top vapor degreaser shall ensure that the following control equipment requirements are met:

(a) The owner or operator of an open top vapor degreaser shall ensure that the following control equipment requirements are met:

(i) Equip the degreaser with a cover that can be opened and closed easily without disturbing the vapor zone.

(ii) Equip the degreaser with the following switches:

(A) A condenser flow switch and thermostat which shuts off sump heat if condenser coolant stops circulating or becomes too warm.

(B) A spray safety switch which shuts off spray pump if the vapor level drops more than ten (10) centimeters (four (4) inches).

(iii) Equip the degreaser with a permanent, conspicuous label which lists the operating requirements.

(vii) Repair solvent leaks immediately or shut down the degreaser if leaks cannot be repaired immediately.

(viii) Store waste solvent only in covered containers and prohibit the disposal or transfer of waste solvent in any manner in which greater than twenty percent (20%) of the waste solvent by weight could evaporate.

(ix) Prohibit the use of workplace fans near the degreaser opening.

(x) Prohibit visually detectable water in the solvent exiting the water separator.c

Compliance Determination Requirements

D.1.4 Testing Requirements [326 IAC 2-7-6(1)]

The Permittee is required to determine the idling emission rate of the solvent cleaning machine using Reference Method 307 in appendix A of 40 CFR 63 Subsection T. In addition, IDEM may require compliance testing at any specific time when necessary to determine if the facility is in compliance. The Permittee performed this initial test on January 6, 1998.

Compliance Monitoring Requirements

D.1.5 Monitoring Procedures [326 IAC 2-7-6(1)]

That pursuant to 40 CFR 63.466 the Permittee shall comply with the following monitoring procedures:

(a) The Permittee shall monitor the hoist speed as described below:

(1) The Permittee shall determine the hoist speed by measuring the time it takes for the hoist to travel a measured distance. The speed is equal to the distance in meters divided by the time in minutes.

(2) The monitoring shall be conducted monthly. If after the first year, no exceedances of the hoist speed are measured, the Permittee may begin monitoring the hoist speed quarterly.

(3) If the exceedance of the hoist speed occurs during quarterly monitoring, the monitoring frequency returns to the monthly until another year of compliance

without an exceedance is demonstrated.

(4) If the Permittee can demonstrate to the commissioner's satisfaction in the initial compliance report that the hoist cannot exceed a speed of 3.4 meters per minute (11 feet per minute), the required monitoring frequency is quarterly, including during the first year of compliance.

(b) The Permittee shall conduct monitoring and record the results, for a reduced room draft, as specified in the following paragraphs:

(1) The Permittee shall conduct an initial monitoring test and, thereafter, monthly monitoring tests of the windspeed within the enclosure using the procedure specified below and a monthly visual inspection of the enclosure to determine if it is free of cracks, holes and other defects.

(A) Determine the direction of the wind current in the enclosure by slowly rotating a velometer inside the entrance to the enclosure until the maximum speed is located.

(B) Record the maximum wind speed.

Recordkeeping and Reporting Requirements [326 IAC 2-7-5(3)][326 IAC 2-7-19

D.1.6 Recordkeeping Requirements

(a) The Permittee shall maintain, in written or electronic form, records of the following information specified below, for the life time of the machine,

(1) Owners's manuals, or if not available, written maintenance and operating procedures, for the solvent cleaning machine and control equipment.

(2) The date of installation of the solvent cleaning machine and all of its control devices. If the exact date of the installation is not known, a letter certifying that the cleaning machine and its control devices were installed prior to, or on, November 29, 1993, or after November 29, 1993, may be substituted.

(4) The Permittee shall maintain records of the initial performance test, including the idling emission rate and values of the monitoring parameters measured during the test.

(5) Records of the halogenated HAP solvent content for each solvent used in a solvent cleaning machine.

(b) The Permittee shall maintain, in written or electronic form, records of the following information specified below for a period of 5 years:

(1) The results of control device monitoring required under 40 CFR63.466.

(2) Information on the actions taken to comply with 40 CFR63.463(e) and (f). This information shall include records of written or verbal orders for replacement parts, a description of the repairs made, and additional monitoring conducted to demonstrate that monitored parameters have returned to accepted levels.

(3) Estimates of annual solvent consumption for each solvent cleaning machine.

D.1.7 Reporting Requirements

(a) The Permittee submitted a test report for tests of idling emissions meeting the specifications in Method 307 of Appendix 40 CFR 63, Subpart T on January 8, 1998.

(b) The Permittee shall submit an annual report by February 1 of each year following the one for which the reporting is being made. This report shall include the requirements as follows:

(1) A signed statement from the facility owner or his designee stating that , "All operators of solvent cleaning machines have received training on the proper operation of solvent cleaning machines and their control devices sufficient to pass the test required in 40 CFR63.463(d)(10)."

(2) An estimate of solvent consumption for each solvent cleaning machine during the reporting period.

(c) The Permittee shall submit an exceedance report to the commissioner semiannually except when, the commissioner determines, on a case-by-case basis that more frequent reporting is necessary to accurately assess the compliance status of the source or, an exceedance occurs. Once an exceedance has occurred the Permittee shall follow a quarterly reporting format until a request to reduce reporting frequency under paragraph 40 CFR63.468 (i) of this section is approved. Exceedance reports shall be delivered or postmarked by the 30th day following the end of each calender half or quarter, as appropriate. The exceedance report shall include the applicable information as given below:

(1) Information on the actions taken to comply with 40 CFR63. 463(e) and (f). This information shall include records of written or verbal orders for replacement parts, a description of the repairs made, and additional monitoring conducted to demonstrate that monitored parameters have returned to accepted levels.

(2) If an exceedance has occurred, the reason for the exceedance and a description of the actions taken.

(3) If no exceedances of a parameter have occurred, or a piece of equipment has not been inoperative, out of control, repaired, or adjusted, such information shall be stated in the report.

(d) Pursuant to 40 CFR63.463 (i), the Permittee who is required to submit an exceedance report on a quarterly (or more frequent) basis may reduce the frequency of reporting to semiannual if the following conditions are met:

(1) The source has demonstrated a full year of compliance without an exceedance.

(2) The Permittee continues to comply with all relevant recordkeeping and monitoring requirements specified in Subpart A (General Provisions) and in 40 CFR 63, Subpart T

(3) The commissioner does not object to a reduced frequency of reporting for the affected source as provided in paragraphs (e)(3)(iii) of Subpart A (General Provisions) of 40 CFR 63.

(e) A summary of the information to document compliance with Conditions D.1.1 and D.1.2 shall be submitted to the address listed in Section C - General Reporting Requirements, of this permit, and to the following address:

United States Environmental Protection Agency, Region V
Air and Radiation Division, Air Enforcement Branch - Indiana (AE-17J)
77 West Jackson Boulevard
Chicago, Illinois 60604-3590

SECTION D.2 FACILITY OPERATION CONDITIONS

Facility Description [326 IAC 2-7-5(15)]

(a) One (1) Paint Booth, identified as Emission Unit #17 (EU17), equipped with an air atomization spray coating gun, with a maximum capacity of 0.39 gal/hr, using dry filters as control, exhausting at one (1) stack identified as stack #3. Installed after May 23, 2000 permit modification.

Emission Limitations and Standards [326 IAC 2-8-4(1)]

D.2.1 Volatile Organic Compounds (VOC) [326 IAC 8-2-9]

Pursuant to 326 IAC 8-2-1 (Surface Coating Emission Limitations), the input of VOC from emission unit 17 (EU17) shall be limited to 15 pounds per day, such that 326 IAC 8-2-9 shall not apply.

D.2.2 Particulate Matter (PM) [326 IAC 6-3]

Pursuant to 326 IAC 6-3 (Process Operations), the allowable PM emission rate from the Paint Booth shall not exceed allowable PM emission rate based on the following equation:

Interpolation and extrapolation of the data for the process weight rate up to 60,000 pounds per hour shall be accomplished by use of the equation:

$E = 4.10\ P^{0.67}$ where E = rate of emission of 0.55 pounds per hour; and
P = process weight rate of less than 100 pounds/hour

Compliance Determination Requirements

D.2.3 Volatile Organic Compounds (VOC)

Compliance with condition D.2.1 shall be demonstrated daily based on coating, cleanup solvent and thinner usage.

D.2.4 Testing Requirements [326 IAC 2-7-6(1),(6)]

The Permittee is not required to test this facility by this permit. However, IDEM may require compliance testing when necessary to determine if the facility is in compliance. If testing is required by IDEM and ERMD, compliance with the particulate limit specified in Condition D.2.2 shall be determined by a performance test conducted in accordance with Section C - Performance Testing.

Record Keeping and Reporting Requirements [326 IAC 2-8-4(3)] [326 IAC 2-8-16]

D.2.5 Record Keeping Requirements

(a) To document compliance with Condition D.2.1 ; the Permittee shall maintain records in accordance with (1) and (3) below. Records maintained for (1) and (3) shall be taken daily and shall be complete and sufficient to establish compliance with the the VOC emission limits established in Condition D.2.1.

(1) The weight of VOC containing material used, including purchase orders and invoices necessary to verify the type and amount used.

(2) The VOC content (weight percent) of each material used

Indiana Department of Environmental Management
Office of Air Management

Addendum to the
Technical Support Document for Part 70 Operating Permit Significant Permit Modification

Source Name:	Horner Electric
Source Location:	1521 East Washington Street, Indianapolis, Indiana 46201
County:	Marion County
SIC Code:	3621
Operation Permit No.:	T097-7787 -00301
Permit Modification No.:	097-12555-00301
Permit Reviewer:	Dana Armstrong

On August, 25 2000 the Office of Air Management (OAM) had a notice published in the Indianapolis Star, Indianapolis, Indiana, stating that Horner Electric had applied for a Significant Modification to a Part 70 Operating Permit to operate a stationary manufacturing operation of rebuilding electrical industrial apparatus for motors and generators. The notice also stated that OAM proposed to issue a permit for this operation and provided information on how the public could review the proposed permit and other documentation. Finally, the notice informed interested parties that there was a period of thirty (30) days to provide comments on whether or not this permit should be issued as proposed.

IDEM submitted comments on the proposed Part 70 permit. The summary of the comments is as follows:

Comment 1:

The source had already conducted the performance test for the degreaser in 1998, Therefore the requirement to test is unnecessary:

Response to Comment 1:

Sources subject to 40 CFR 63 Subpart T as it applies to batch vapor degreasers have two general methods of compliance to choose from.. One or more controls will be required under 40 CFR 63.463(b)(i). This is one method of compliance. The source may also opt to comply using an idling emission rate, pursuant to 40 CFR 63.463(b)(ii). The source requested a change in the method of compliance from 40 CFR 63.463(b)(2)(i) to 40 CFR 63.463(b)(2)(ii). Prior to this change, the source was not required to test the idling emission rate using method 307 in Appendix A of Subpart T. The source had already tested the idling emission rate in January of 1998, even though it was not required to do so by the method of compliance it was subject to at the time. Since the testing requirement was a new requirement in the permit resulting from a change in the method of compliance, it was included in the permit. Since the test had already been done and it is normally a one time requirement, it does seem a bit redundant to mention it in the permit. The correct response to this comment is to leave the requirement in, but amend the permit modification to communicate the fact that the initial test was already performed. To leave the requirement out entirely might make subsequent compliance testing of this parameter unenforceable.

Condition D.1.4 will be changed to read as follows:

D.1.4 Testing Requirements [326 IAC 2-7-6(1)]

The Permittee ~~shall~~ **is required to** determine the idling emission rate of the solvent cleaning machine using Reference Method 307 in appendix A of 40 CFR 63 Subsection T. In addition, IDEM may require compliance testing at any specific time when necessary to determine if the facility is in compliance. **The Permittee performed this initial test on January 6, 1998.**

Comment 2:

Nowhere in the D section for the degreaser does it mention any of the reporting requirements for subpart T. They must submit an annual compliance report and semi-annual exceedance reports as per 40 CFR 63.468. This should be clearly stated in the permit. This annual report is NOT the same as the annual TVOP certification.

Response to Comment 2:

The requirements for the annual report and semi-annual exceedance reports were left out in error. The permit will be amended to include these requirements.

Condition D.1.7 will be changed to read as follows:

D.1.7 Reporting Requirements

(**a**) **The Permittee submitted a test report for tests of idling emissions meeting the specifications in Method 307 of Appendix 40 CFR 63, Subpart T on January 8, 1998.**

(b) The Permittee shall submit an annual report by February 1 of each year following the one for which the reporting is being made. This report shall include the requirements as follows:

- **(1) A signed statement from the facility owner or his designee stating that , "All operators of solvent cleaning machines have received training on the proper operation of solvent cleaning machines and their control devices sufficient to pass the test required in 40 CFR63.463(d)(10)."**
- **(2) An estimate of solvent consumption for each solvent cleaning machine during the reporting period.**

(c) The Permittee shall submit an exceedance report to the commissioner semiannually except when, the commissioner determines, on a case-by-case basis that more frequent reporting is necessary to accurately assess the compliance status of the source or, an exceedance occurs. Once an exceedance has occurred the Permittee shall follow a quarterly reporting format until a request to reduce reporting frequency under paragraph 40 CFR63.468 (i) of this section is approved. Exceedance reports shall be delivered or postmarked by the 30th day following the end of each calender half or quarter, as appropriate. The exceedance report shall include the applicable information as given below:

- **(1) Information on the actions taken to comply with 40 CFR63. 463(e) and (f). This information shall include records of written or verbal orders for replacement parts, a description of the repairs made, and additional monitoring conducted to demonstrate that monitored parameters have returned to accepted levels.**
- **(2) If an exceedance has occurred, the reason for the exceedance and a description of the actions taken.**
- **(3) If no exceedances of a parameter have occurred, or a piece of equipment has not been inoperative, out of control, repaired, or adjusted, such information shall be stated in the report.**

(d) Pursuant to 40 CFR63.463 (i), the Permittee who is required to submit an exceedance report on a quarterly (or more frequent) basis may reduce the frequency of reporting to semiannual if the following conditions are met:

- **(1) The source has demonstrated a full year of compliance without an exceedance.**
- **(2) The Permittee continues to comply with all relevant recordkeeping and**

monitoring requirements specified in Subpart A (General Provisions) and in 40 CFR 63, Subpart T

(3) The commissioner does not object to a reduced frequency of reporting for the affected source as provided in paragraphs (e)(3)(iii) of Subpart A (General Provisions) of 40 CFR 63.

(e) A summary of the information to document compliance with Conditions D.1.1 and D.1.2 shall be submitted to the address listed in Section C - General Reporting Requirements, of this permit, and to the following address:

United States Environmental Protection Agency, Region V
Air and Radiation Division, Air Enforcement Branch - Indiana (AE-17J)
77 West Jackson Boulevard
Chicago, Illinois 60604-3590

Indiana Department of Environmental Management
Office of Air Management
and
Indianapolis Environmental Resources Management Division

Technical Support Document (TSD) for a Significant Permit Modification

Source Background and Description

Source Name:	**Horner Electric**
Source Location:	**1521 East Washington Street, Indianapolis, Indiana 46201**
County:	**Marion**
SIC Code:	**3621**
Operation Permit No.:	**T 097-7787-00301, Issued on June 30, 1999**
Permit Modification No.:	**T 097-12555-00301**
Permit Reviewer:	**DRA**

The Environmental Resources Management Division (ERMD) has reviewed a modification application from Horner Electric relating to the operation of rebuilding electrical industrial apparatus for motors and generators.

History

On June 30, 1999, the source (Horner Electric) was issued a Title V operating permit. The source applied for the following permit changes on May 23, 2000:

(1) That the method of compliance for the VOC NESHAP used for the vapor degreaser be changed from a control set (pursuant to 40 CFR 63.463(b)(2)(i)) to an idling emission limit (pursuant to 40 CFR 63.463(b)(ii)).

(2) That the control language that had to do with a “superheated vapor system” be removed, thereby relaxing the compliance requirements.

(3) That requirements limiting exhaust ventilation rate be removed. No exhaust ventilation exists above the degreaser. Exhaust ventilation is not required, thereby relaxing compliance requirements.

(4) That equipment descriptions and applicable requirements be modified to include a new paint booth (described as emissions unit 17) and omit equipment descriptions and applicable requirements pertaining to a paint booth which was discontinued (described as emissions unit 6).

(5) That NESHAP requirements for reporting as required by IDEM be modified in section D.1.7 of the original Title V Permit. Reporting requirements are are completely delineated as per the permit model and NESHAP requirements, so this change was deemed not necessary.

(6) That certain formatting, typographical errors, and one date on an equipment description be changed.

Existing Approvals

The source was issued a Part 70 Operating Permit T 097-7787-00301 on June 30, 1999.

Enforcement Issue

On January 21, 2000, the source was issued a notice of violation for violations found on August 24, 1999 and December 2, 1999. The source has the following enforcement actions pending:

(1) The source failed to control air disturbances across the top of emissions unit 14, a vapor degreaser. The source had placed a fan in close proximity to the uncovered vapor degreaser. This action was in violation of the requirements in Section D.1.2(b)(1) of the permit which established a reduced room draft as a method of VOC emissions control of the degreaser. This requirement was pursuant to 40 CFR 463(d).

(2) The source was cited for inadequate record keeping documentation of the degreaser's freeboard ratio, reduced room draft, and temperature monitoring at the center of the superheated vapor zone.

(3) The source was cited for failure to maintain records of coating usage, cleanup solvent usage, and thinner usage. This inaction was in violation of the requirements in section D.2.4, essential for establishing compliance with the requirements of D.2.1, which was implemented in order that 326 IAC 8-2-9 did not apply.

(4) The source was cited for construction and operating without a permit, for the small VPI Dip Tank (Emission Unit #10). It was also cited for a recordkeeping violation on the Large VPI Dip Tank (Emission Unit #9) and the Large Varnish Dip Tank (Emission Unit #8). It was unable to provide daily records of the number of parts coated for these units.

(5) Source was sent a letter on July 11, 2000 stating that OAM did not receive annual National Emissions Standards for Halogenated Solvent Cleaners. They had also not received any of the semi annual exceedance reports.

Issues pertaining to January 21 notice of violation are currently unresolved. Issue Number five (5) is separate from January 21 notice of violation, and is also unresolved.

Stack Summary (as pertains to modifications only)

Stack ID	Operation	Height (feet)	Diameter (feet)	Flow Rate (acfm)	Temperature (^{0}F)
8		25	2.833	18000	70

(New stack is for the new paint booth. The old stack for previous paint booth (stack 3) will be removed at a later date. All other stack data remains unchanged from previous permit application)

Recommendation

The staff recommends to the Commissioner that a Minor Source Modification be issued for construction approval of the new paint booth (EU17) in parallel with a Significant Permit Modification to incorporate this Minor Source Modification as well as all of the other changes. This recommendation is based on the following facts and conditions:

(1) Unless otherwise stated, information used in this review was derived from the application and additional information submitted by the applicant.

(2) An application for the purposes of this review was received on May 23, 2000

(3) Construction of new paint booth is being implemented as a Minor Source Modification. incorporated by this Significant Permit Modification, because Title 1 modifications as in 326 IAC 2-7-10.5(d)(6) are being implemented. In addition, requested changes 1-3 meet the requirements of a Significant Permit Modification pursuant to 326 IAC 2-7-12.

Emission Calculations Changes

See Appendix A, pages 1 through 3 of 8 for detailed emissions calculations based on new paint booth data. All other calculations of the original permit remain the same. Calculations were repaginated and updated, and source wide potential to emit was summed up on page 8.

Potential To Emit

Pursuant to 326 IAC 2-1.1-1(16), Potential to Emit is defined as "the maximum capacity of a stationary source to emit any air pollutant under its physical and operational design. Any physical or operational limitation on the capacity of a source to emit an air pollutant, including air pollution control equipment and restrictions on hours of operation or type or amount of material combusted, stored, or processed shall be treated as part of its design if the limitation is enforceable by the U. S. EPA."

Pollutant	Potential Emissions (tons/year)
PM	16.84
PM-10	1.68
SO_2	less than 1
VOC	46.15
CO	less than 1
NO_x	less than 1

Note: For the purpose of determining Title V applicability for particulates, PM-10, not PM, is the regulated pollutant in consideration

HAP's	Potential Emissions (tons/year)
Trichloroethylene	27.67
Toluene	0.78
Xylene	0.78
Methyl ethyl Ketone	0.76
Methyl Isobutyl Ketone	0.08
Total HAP	30.07

(a) The potential to emit (as defined in 326 IAC 2-1.1-1(16)) of any single HAP is equal to or greater than ten (10) tons per year and the potential to emit (as defined in 326 IAC 2-7-1(29)) of a combination HAPs is greater than or equal to twenty-five (25) tons per year. Therefore, the source is subject to the provisions of 326 IAC 2-7.

Actual Emissions

The following table shows the actual emissions from the source. This information reflects the 1999 OAM emission data.

Pollutant	Actual Emissions (tons/year)
PM	less than 1
PM-10	less than 1
SO_2	less than 1
VOC	20.29
CO	less than 1
NO_x	less than 1
HAP (Trichloroethylene)	18.97
HAP (Toluene)	0.231
HAP (Xylene)	0.132
HAP (Methyl ethyl ketone)	0.378
HAP (Methyl isobutyl ketone)	0.082

Limited Potential to Emit

The table below summarizes the limited potential to emit of only those pollutants which are limited by this permit.

	Limited Potential to Emit (tons per year)						
Process/facility	PM	PM-10	SO_2	VOC	CO	NO_X	HAPs
Paint Booth (EU17)				2.7 (1)			
Large VPI Dip Tank (EU9)				2.8 (1)			
Small VPI Dip Tank (EU10)				2.8 (1)			
Trichloroethylene Batch Vapor Degreaser (EU4)							>25 (2)

(1) Potential to emit based on limiting VOC emissions to less than 15 lbs/day such that 326 IAC 8-2-9 shall not apply because all facilities were existing in Marion County as of or after July 1st, 1990.

(2) Facility emits greater than 25 tons per year such that it is a Major source per section 112 of Clean Air Act.

County Attainment Status

The source is located in Marion County.

Pollutant	Status
PM-10	attainment
SO_2	attainment
NO_2	attainment
Ozone	attainment
CO	attainment
Lead	attainment

(a) Volatile organic compounds (VOC) and oxides of nitrogen (NOx) are precursors for the formation of ozone. Therefore, VOC and NO_X emissions are considered when evaluating the rule applicability relating to the ozone standards. Marion County has been designated as attainment or unclassifiable for ozone.

Federal Rule Applicability

The batch vapor degreaser, identified as EU#4, is subject to the National Emission Standards for Hazardous Air Pollutants, 326 IAC 14, (40 CFR 63 Subpart T) since it uses trichloroethylene as the cleaning agent. This batch vapor degreaser was installed prior to 11/29/93; thus, the source shall be in compliance with this subpart no later than 12/2/97. The source chooses to change it's method of compliance with Subpart T from 40 CFR 63.463(b)(i) to 40 CFR 63.463(b)(2)(ii) and all consequent applicable requirements. The source is currently in compliance with the aforementioned requirements.

State Rule Applicability - Entire Source

There are no new source wide state rule applicability requirements

State Rule Applicability - Individual Facilities

326 IAC 8-2-9 (Miscellaneous Metal Coating)

The VOC input for the paint booth (EU#17) shall not exceed 15 pounds per day to stay under 15 pounds per day VOC output.

326 IAC 8-3-6 (Open Top Vapor Degreaser Operations and Control Requirements)

There are no additional control requirements, and all requirements pertaining to the "superheated vapor system" control have been discontinued. The source shall now demonstrate compliance with 40 CFR 63.463(b)(2)(ii) by maintaining an idling emission rate of 0.045 pounds per hour per square foot of solvent air interface.

Compliance Requirements

The source is now required to initially determine an idling emission rate of the solvent cleaning machine using Reference Method 307 in appendix A of 40 CFR 63, Subsection T. The source performed this initial test on January 6, 1998. In addition, IDEM may require compliance testing at any specific time when necessary to determine if the facility is in compliance. The source is also required to maintain records of the initial performance test, including the idling emission rate and values of the monitoring parameters measured during the test.

Conclusion

The operation of rebuilding electrical industrial apparatus for motors and generators shall be subject to the conditions of Part 70 Permit No. T097-7787-00301 except those revised by the attached Part 70 Permit Modifications No. T097-12555-00301 and Source Modification T 097-12304-00301.

Permit changes

Section A: Source Summary
A.2 Emission Unit and Pollution Control Equipment Summary [326 IAC 2-7-4(c)(3)][326 IAC 2-7-5(15)]

A.2(e) One (1) Large VPI Dip Tank, identified as emission unit #9 (EU9), maximum capacity of 2.08 lb/hr, not exhausting at a stack/vent, with no control equipment, installed in ~~1987~~**1996**.

A.2(b) One (1) Paint Booth, identified as Emission Unit ~~#6 (EU6)~~, **#17 (EU17)** equipped with an air atomization spray coating gun, with a maximum capacity of 0.39 gal/hr, using dry filters as control, exhausting at one (1) stack identified as stack ~~#3~~**#8**. Installed ~~pre-1983.~~ **After May 23, 2000**.

Section D.1
D.1.2 Halogenated Sovent Cleaning Machine NESHAP [40 CFR Part 63, Subpart T]

D.1.2(a)(2) ~~The cleaning machine shall be employed with a control combination of freeboard ratio of 1.0, reduced room draft, and superheated vapor~~.
The Permittee shall demonstrate that the solvent cleaning machine can achieve and maintain an idling emission limit of 0.45 pounds per hour per square foot of solvent/air interface area as determined using the procedures in 40 CFR 63.465(a) and appendix A to 40 CFR 63, Subpart T.

D.1.2(c) That pursuant to 40 CFR 63.463 (e), the Permittee shall comply with the following requirements:

(1) The Permittee shall conduct monitoring of each control device used to comply with

§63. 463 as provided in 40 CFR 63. 466, monitoring procedures.

(2) Determine during each monitoring period if the control device used to comply with the above standards meets the following requirements:

(B) When using a reduced room draft the Permittee shall:

(i) ensure that the flow or movement of air across the top of the freeboard area of the solvent cleaning machine or within the solvent cleaning machine enclosure does not exceed 15.2 meters per minute (50 feet per minute) at anytime as measured using the procedures in 40 CFR63.466(d).

(ii) establish and maintain the operating conditions under which the wind speed was demonstrated to be 15.2 meters per minute (50 feet per minute) or less as described in 40 CFR63.466 (d).

~~(F) When using a superheated vapor system the Permittee shall:~~

~~(i) ensure that the temperature of the solvent vapor at the center of the superheated vapor zone is at least 10EF above the solvent's boiling point.~~

~~(ii) ensure that the manufacturer's specifications for determining the minimum proper dwell time within the superheated vapor system is followed.~~

~~(iii) ensure that parts remain within the superheated vapor for at least the minimum proper dwell time.~~

(3) An exceedance has occurred if :

~~(A) the requirements of paragraphs (c)(2)(B)(ii),(c)(2)(F)(ii), (c)(2)(F)(iii), of this condition are not met; and~~

(B) the requirements of paragraphs (c)(2)(B)(i)~~, and (c)(2)(F)(i)~~ of this condition have not been met and are not corrected within 15 days of detection. Adjustments or repairs shall be made to the solvent cleaning system or control device to reestablish required levels. The parameters must be remeasured immediately upon adjustment or repair and demonstrated to be within the required limits.

(4) the owner or operator shall report all exceedances and all corrections and adjustments made to avoid an exceedance as specified in 40 CFR63.468.

D.1.3 Degreasing Operations [326 IAC 8-3-6]

D.1.3(b)(ix) ~~Prohibit the exhaust ventilation rate from exceeding twenty (20) cubic meters per minute per square meter (sixty-five (65) cubic feet per minute per square foot) of degreaser open area unless a greater ventilation rate is necessary to meet Occupational Safety and Health Administration requirements.~~

D.1.4 Testing Requirements [326 IAC 2-7-6(1)]

D.1.4 ~~The Permittee is not required to test this facility by this permit or by 40 CFR Part 63; 40 CFR 63.465 Test Methods. However,~~ **The Permittee shall determine the**

idling emission rate of the solvent cleaning machine using Reference Method 307 in appendix A of 40 CFR 63 Subsection T. In addition, IDEM may require compliance testing at any specific time when necessary to determine if the facility is in compliance.

D.1.5 Compliance Monitoring Requirements [326 IAC 2-7-6(1)]

D.1.5 That pursuant to 40 CFR 63.466 the Permittee shall comply with the following monitoring procedures:

~~(a) The Permittee shall conduct monitoring and record the results on a weekly basis for the control devices, as appropriate, specified in paragraph(s) below:~~

~~(1) The Permittee shall use a thermometer or thermocouple to measure the temperature at the center of the superheated solvent vapor zone while the solvent cleaning machine is in the idling mode.~~

~~(4) The Permittee shall conduct monitoring and record the results on a monthly basis for the control devices, as appropriate , specified in paragraph below:~~

~~(c)~~ (a) The Permittee shall monitor the hoist speed as described below:

(1) The Permittee shall determine the hoist speed by measuring the time it takes for the hoist to travel a measured distance. The speed is equal to the distance in meters divided by the time in minutes.

(2) The monitoring shall be conducted monthly. If after the first year, no exceedances of the hoist speed are measured, the Permittee may begin monitoring the hoist speed quarterly.

(3) If the exceedance of the hoist speed occurs during quarterly monitoring, the monitoring frequency returns to the monthly until another year of compliance without an exceedance is demonstrated.

(4) If the Permittee can demonstrate to the commissioner's satisfaction in the initial compliance report that the hoist cannot exceed a speed of 3.4 meters per minute (11 feet per minute), the required monitoring frequency is quarterly, including during the first year of compliance.

~~(d)~~(b) The Permittee shall conduct monitoring and record the results, for a reduced room draft, as specified in the following paragraphs:

(1) The Permittee shall conduct an initial monitoring test and, thereafter, monthly monitoring tests of the windspeed within the enclosure using the procedure specified below and a monthly visual inspection of the enclosure to determine if it is free of cracks, holes and other defects.

(A) Determine the direction of the wind current in the enclosure by slowly rotating a velometer inside the entrance to the enclosure until the maximum speed is

located.

(B) Record the maximum wind speed.

Recordkeeping and Reporting Requirements [326 IAC 2-7-5(3)] [326 IAC 2-7-19]
D.1.6 Recordkeeping Requirements

D.1.6(a)(4) **The Permittee shall maintain records of the initial performance test, including the idling emission rate and values of the monitoring parameters measured during the test**.

Changes Made in Section D.2
D.2 (Facility Description Box)

Facility Description [326 IAC 2-7-5(15)]
(a) One (1) Paint Booth, identified as Emission Unit ~~#6 (EU6)~~ **Emission Unit #17 (EU17),** equipped with an air atomization spray coating gun, with a maximum capacity of 0.39 gal/hr, using dry filters as control, exhausting at one (1) stack identified as stack #3. ~~Installed pre-1983~~ **Installed after May 23, 2000 permit modification.**

D.2.1 Volatile Organic Compounds (VOC) [326 IAC 8-2-9]

Pursuant to 326 IAC 8-2-1 (Surface Coating Emission Limitations), the input of VOC from emission unit ~~6~~**17**~~(EU6)~~**(EU17)** shall be limited to 15 pounds per day such that 326 IAC 8-2-9 shall not apply.

Appendix A: Emissions Calculations
VOC and Particulate
From Surface Coating Operations

Company Name: Horner Electric
Address City IN Zip: 1521 East Washington Street, Indianapolis, Indiana 46201
Permit No.: T097-7787-00301
SIC: 3621 **Vent ID:** Emission Unit #6 (EU6)
Reviewer: K Leone
Date: December 1998

Potential to Emit (PTE)

Material	Density (Lb/Gal)	Weight % Volatile (H20& Organics)	Weight % Water	Weight % Organics	Volume % Water	Volume % Non-Vol (solids)	Gal of Mat (gal/unit)	Maximum (unit/hour)	Pounds VOC per gallon of coating less water	Pounds VOC per gallon of coating	Potential VOC pounds per hour	Potential VOC pounds per day	Potential VOC tons per year	Particulate Potential ton/yr	lb VOC /gal solids	Transfer Efficiency
#126 Heresite EP-6300 Coating	9.20	53.5%	0.0%	53.5%	0.0%	48.0%	0.0970	4.00	4.92	4.92	1.91	45.83	8.36	1.82	10.25	75%
#135 Elite Water Based Primer	9.60	55.0%	57.0%	55.0%	57.0%	67.0%	0.0970	4.00	5.03	5.28	2.05	49.17	8.97	1.84	7.88	75%
#102 Heresite S-330 Solvent	6.71	100.0%	0.0%	100.0%	0.0%	0.0%	0.0970	4.00	5.85	6.71	2.60	62.48	11.40	0.00	ERR	75%
t case coating, maximum units per hour and 8,760 hours/yr.											**2.60**	**62.48**	**11.40**	**1.68**		

(1) Data from Mfr's sheet

METHODOLOGY

Pounds of VOC per Gallon Coating less Water = (Density (lb/gal) * Weight % Organics) / (1-Volume % water)
Pounds of VOC per Gallon Coating = (Density (lb/gal) * Weight % Organics)
Potential VOC Pounds per Hour = Pounds of VOC per Gallon coating (lb/gal) * Gal of Material (gal/unit) * Maximum (units/hr)
Potential VOC Pounds per Day = Pounds of VOC per Gallon coating (lb/gal) * Gal of Material (gal/unit) * Maximum (units/hr) * (24 hr/day)
Potential VOC Tons per Year = Pounds of VOC per Gallon coating (lb/gal) * Gal of Material (gal/unit) * Maximum (units/hr) * (8760 hr/yr) * (1 ton/2000 lbs)
Particulate Potential Tons per Year = (units/hour) * (gal/unit) * (lbs/gal) * (1- Weight % Volatiles) * (1-Transfer efficiency) *(8760 hrs/yr) *(1 ton/2000 lbs)
Pounds VOC per Gallon of Solids = (Density (lbs/gal) * Weight % organics) / (Volume % solids)
Total = Worst Coating + Sum of all solvents used

Transfer efficiency was estimated at 75% for flat surface work and electrostatic air atomized, per "Air Pollution Engineering Manual" (AP-40), Table 2, page 362, 1992 edition.

Appendix A: Emissions Calculations
HAP Emission Calculations
From Surface Coating Operations

Company Name: Horner Electric
Address City IN Zip: 1521 East Washington Street, Indianapolis, Indiana 46201
Permit No.: T097-7787-00301
Vent ID: Emission Unit #6 (EU6)
Reviewer: K Leone
Date: December 1998

Material	Density (Lb/Gal)	Gal of Mat (gal/unit)	Maximum (unit/hour)	Weight % 2-Butoxyethanol (glycol ether)	Weight % Methyl Ethyl Ketone	Weight % Glycol Ethers	Weight % Toluene	Weight % Xylene	Weight % Methyl Isobutyl Ketone	Weight % Benzene	Weight % Ethylbenzene	2-Butoxyeth-onal (ton/yr) (glycol ether)	Methyl Ethyl Ketone (ton/yr)	Glycol Ethers (ton/yr)	Toluene (ton/yr)	Xylene (ton/yr)	Methyl Isobutyl Ketone (ton/yr)	Benzene (ton/yr)	Ethylbenzene (ton/yr)	Total Potential per coating (tons/yr)
#126 Heresite E	9.2	0.0970	4.00	0.0%	5.0%	0.0%	5.0%	5.0%	5.0%	0.0%	0.0%	0.00	0.78	0.00	0.78	0.78	0.78	0.00	0.00	3.13
#135 Elite Wate	9.6	0.0970	4.00	0.0%	5.0%	0.0%	2.0%	2.0%	5.0%	0.0%	0.0%	0.00	0.82	0.00	0.33	0.33	0.82	0.00	0.00	2.28
#102 Heresite S	6.71	0.0970	4.00	0.0%	0.0%	0.0%	2.0%	1.0%	0.0%	0.0%	0.0%	0.00	0.00	0.00	0.23	0.11	0.00	0.00	0.00	0.34
												0.00	0.76	0.00	**0.78**	**0.78**	0.08	0.00	0.00	**3.13**

* Determine Potential HAPs at Limited PTE: 249 tons VOC/yr x yr/292.31 tons VOC x 32.6 ton HAP = 27.77 tons HAP
State Potential Emissions based upon worst case HAP loading and 8,760 hr/yr.

METHODOLOGY
HAPS emission rate (tons/yr) = Density (lb/gal) * Gal of Material (gal/unit) * Maximum (unit/hr) * Weight % HAP * 8760 hrs/yr * 1 ton/2000 lbs

Appendix A: Emissions Calculations
VOC and Particulate
From Surface Coating Operations

Company Name: Horner Electric
Address City IN Zip: 1521 East Washington Street, Indianapolis, Indiana 46201
Permit No.: T097-7787-00301
Vent ID: Emission Unit #6 (EU6)
Reviewer: K Leone
Date: December 1998

	PM	PM-10	SO2	NOx	CO	VOC	HAPS Single	HAPS Combination
Paint Booth EU-17	1.68	1.68	0	0	0	11.40	0.78	3.13
Insignificant	0.00	0.00	0	0	0	0.00	0.00	0.00
Total Emissions	1.68	1.68	0	0	0	11.40	0.78	3.13

Appendix A: Emission Calculations

Abrasive Blasting

Company Name: Horner Electric
Address City IN Zip: 1521 East Washington Street Indianapolis, Indiana 46201
Reviewer: Kevin Leone
Date: December 1998

Table 1 - Emission Factors for Abrasives

	Emission Factor	
Abrasive	PM / lb abrasive	PM10 / lb PM
Sand	0.041	0.70
Grit	0.010	0.70
Steel Shot	0.004	0.86
Other	0.010	

Table 2 - Density of Abrasives (lb/ft3)

Abrasive	Density (lb/ft3)
Al oxides	160
Sand	99
Steel	487

Table 3 - Sand Flow Rate (FR1) Through Nozzle (lb/hr)

Flow rate of Sand Through a Blasting Nozzle as a Function of Nozzle pressure and Internal Diameter

	Nozzle Pressure (psig)							
Internal diame	30	40	50	60	70	80	90	100
1/8	28	35	42	49	55	63	70	77
3/16	65	80	94	107	122	135	149	165
1/4	109	138	168	195	221	255	280	309
5/16	205	247	292	354	377	420	462	507
3/8	285	355	417	477	540	600	657	720
7/16	385	472	560	645	755	820	905	940
1/2	503	615	725	835	945	1050	1160	1265
5/8	820	990	1170	1336	1510	1680	1850	2030
3/4	1140	1420	1670	1915	2160	2400	2630	2880
1	2030	2460	2900	3340	3780	4200	4640	5060

Calculations

Adjusting Flow Rates for Different Abrasives and Nozzle Diameters

Flow Rate (FR) = Abrasive flow rate (lb/hr) with internal nozzle diameter (ID)	
FR1 = Sand flow rate (lb/hr) with internal nozzle diameter (ID1) From Table 3 =	221
D = Density of abrasive (lb/ft3) From Table 2 =	155
D1 = Density of sand (lb/ft3) =	99
ID = Actual nozzle internal diameter (in) =	0.25
ID1 = Nozzle internal diameter (in) from Table 3 =	0.25

Flow Rate (FR) (lb/hr) = **346.010** per nozzle

Uncontrolled Emissions (E, lb/hr)

EF = emission factor (lb PM/ lb abrasive) From Table 1 =	0.010
FR = Flow Rate (lb/hr) =	346.010
w = fraction of time of wet blasting =	0 %
N = number of nozzles =	1

Uncontrolled Emissions =	**3.46 lb/hr**
	15.16 ton/yr

METHODOLOGY

Emission Factors from Stappa Alapco, Section 3 "Abrasive Blasting"
Ton/yr = lb/hr X 8760 hr/yr X ton/2000 lbs
Flow Rate (FR) (lb/hr) = FR1 x (ID/ID1)2 x (D/D1)
E = EF x FR x (1-w/200) x N

EU4 - Degreaser

Degreaser		Usage	Density	Precent	Potential VOC Emissions	
Substance		gal/day	lb/gal	VOC by Wt.	lbs/day	tons/yr
Trichloroethylene		12	12.18	100.00%	146.16	26.67

EU 7 - Varnish Tank #1

	lb VOC/gallon	gallons/year	lb VOC/year	ton VOC/year	ton HAP/year
Thermopoxy	4.42	220	972	0.49	
Xylene	7.18	57	272.8	0.14	0.14
Totals		277	1244.8	0.63	0.14

EU 8 - Varnish Tank #2

	lb VOC/gallon	gallons/year	lb VOC/year	ton VOC/year	ton HAP/year
Sterling	3.59	110	395	0.2	
Xylene	7.18	19	136	0.07	0.07
Totals		129	531	0.27	0.07

Both	0	406	1775.8	0.9	0.21

EU 9 - VPI Tank #1

	lb VOC/gallon	gallons/year	lb VOC/year	ton VOC/year
709A	3.8	1,930	7334	3.6
Totals		1,930	7334	3.6

EU 10 - VPI Tank #2

	lb VOC/gallon	gallons/year	lb VOC/year	ton VOC/year
709A	3.8	1,930	7334	3.6
Totals		1,930	7334	3.6

both	0	3860	14668	7.2

Stack gas conversions

S/V ID	Stack flow rate in scfm or cfm	Stack gas temp	acfm
1	300	1100	883.0189
2	390	1500	1442.264
3	100	70	100
4	500	450	858.4906
5	750	500	1358.491
6	200	500	362.2642
7	19300	70	19300
8	18000	70	18000

add columns as necessary

Sourcewide PTE	PM	PM-10	SO2	NOx	CO	VOC	HAPS Single	HAPS Combination
Paint Booth	1.68	1.68	0.00	0.00	0.00	11.40	0.78	3.13
Sandblaster	15.16							
Degreaser						26.67	26.67	26.67
Varnish Tanks						0.9	0.21	
VPI Tanks						7.2		
Total	16.84	1.68	0.00	0.00	0.00	46.18	27.67	29.80

Appendix A: Emissions Calculations
VOC and Particulate
From Surface Coating Operations

Company Name: Horner Electric
Address City IN Zip: 1521 East Washington Street, Indianapolis, Indiana 46201
Permit No.: T097-7787-00301
SIC: 3621 **Vent ID:** Emission Unit #6 (EU6)
Reviewer: K Leone
Date: December 1998

Potential to Emit (PTE)

Material	Density (Lb/Gal)	Weight % Volatile (H20& Organics)	Weight % Water	Weight % Organics	Volume % Water	Volume % Non-Vol (solids)	Gal of Mat (gal/unit)	Maximum (unit/hour)	Pounds VOC per gallon of coating less water	Pounds VOC per gallon of coating	Potential VOC pounds per hour	Potential VOC pounds per day	Potential VOC tons per year	Particulate Potential ton/yr	lb VOC /gal solids	Transfer Efficiency
#126 Heresite EP-6300 Coating	9.20	53.5%	0.0%	53.5%	0.0%	48.0%	0.0970	4.00	4.92	4.92	1.91	45.83	8.36	1.82	10.25	75%
#135 Elite Water Based Primer	9.60	55.0%	57.0%	55.0%	57.0%	67.0%	0.0970	4.00	5.03	5.28	2.05	49.17	8.97	1.84	7.88	75%
#102 Heresite S-330 Solvent	6.71	100.0%	0.0%	100.0%	0.0%	0.0%	0.0970	4.00	5.85	6.71	2.60	62.48	11.40	0.00	ERR	75%
t case coating, maximum units per hour and 8,760 hours/yr.											**2.60**	**62.48**	**11.40**	**1.68**		

(1) Data from Mfr's sheet

METHODOLOGY

Pounds of VOC per Gallon Coating less Water = (Density (lb/gal) * Weight % Organics) / (1-Volume % water)
Pounds of VOC per Gallon Coating = (Density (lb/gal) * Weight % Organics)
Potential VOC Pounds per Hour = Pounds of VOC per Gallon coating (lb/gal) * Gal of Material (gal/unit) * Maximum (units/hr)
Potential VOC Pounds per Day = Pounds of VOC per Gallon coating (lb/gal) * Gal of Material (gal/unit) * Maximum (units/hr) * (24 hr/day)
Potential VOC Tons per Year = Pounds of VOC per Gallon coating (lb/gal) * Gal of Material (gal/unit) * Maximum (units/hr) * (8760 hr/yr) * (1 ton/2000 lbs)
Particulate Potential Tons per Year = (units/hour) * (gal/unit) * (lbs/gal) * (1- Weight % Volatiles) * (1-Transfer efficiency) *(8760 hrs/yr) *(1 ton/2000 lbs)
Pounds VOC per Gallon of Solids = (Density (lbs/gal) * Weight % organics) / (Volume % solids)
Total = Worst Coating + Sum of all solvents used

Transfer efficiency was estimated at 75% for flat surface work and electrostatic air atomized, per "Air Pollution Engineering Manual" (AP-40), Table 2, page 362, 1992 edition.

Appendix A: Emissions Calculations
HAP Emission Calculations
From Surface Coating Operations

Company Name: Horner Electric
Address City IN Zip: 1521 East Washington Street, Indianapolis, Indiana 46201
Permit No.: T097-7787-00301
Vent ID: Emission Unit #6 (EU6)
Reviewer: K Leone
Date: December 1998

Material	Density (Lb/Gal)	Gal of Mat (gal/unit)	Maximum (unit/hour)	Weight % 2-Butoxyethanol (glycol ether)	Weight % Methyl Ethyl Ketone	Weight % Glycol Ethers	Weight % Toluene	Weight % Xylene	Weight % Methyl Isobutyl Ketone	Weight % Benzene	Weight % Ethylbenzene	2-Butoxyeth-onal (ton/yr) (glycol ether)	Methyl Ethyl Ketone (ton/yr)	Glycol Ethers (ton/yr)	Toluene (ton/yr)	Xylene (ton/yr)	Methyl Isobutyl Ketone (ton/yr)	Benzene (ton/yr)	Ethylbenzene (ton/yr)	Total Potential per coating (tons/yr)
#126 Heresite E	9.2	0.0970	4.00	0.0%	5.0%	0.0%	5.0%	5.0%	5.0%	0.0%	0.0%	0.00	0.78	0.00	0.78	0.78	0.78	0.00	0.00	3.13
#135 Elite Wate	9.6	0.0970	4.00	0.0%	5.0%	0.0%	2.0%	2.0%	5.0%	0.0%	0.0%	0.00	0.82	0.00	0.33	0.33	0.82	0.00	0.00	2.28
#102 Heresite S	6.71	0.0970	4.00	0.0%	0.0%	0.0%	2.0%	1.0%	0.0%	0.0%	0.0%	0.00	0.00	0.00	0.23	0.11	0.00	0.00	0.00	0.34
												0.00	0.76	0.00	**0.78**	**0.78**	0.08	0.00	0.00	**3.13**

* Determine Potential HAPs at Limited PTE: 249 tons VOC/yr x yr/292.31 tons VOC x 32.6 ton HAP = 27.77 tons HAP
State Potential Emissions based upon worst case HAP loading and 8,760 hr/yr.

METHODOLOGY
HAPS emission rate (tons/yr) = Density (lb/gal) * Gal of Material (gal/unit) * Maximum (unit/hr) * Weight % HAP * 8760 hrs/yr * 1 ton/2000 lbs

Appendix A: Emissions Calculations
VOC and Particulate
From Surface Coating Operations

Company Name: Horner Electric
Address City IN Zip: 1521 East Washington Street, Indianapolis, Indiana 46201
Permit No.: T097-7787-00301
Vent ID: Emission Unit #6 (EU6)
Reviewer: K Leone
Date: December 1998

	PM	PM-10	SO2	NOx	CO	VOC	HAPS Single	HAPS Combination
Paint Booth EU-17	1.68	1.68	0	0	0	11.40	0.78	3.13
Insignificant	0.00	0.00	0	0	0	0.00	0.00	0.00
Total Emissions	1.68	1.68	0	0	0	11.40	0.78	3.13

Appendix A: Emission Calculations

Abrasive Blasting

Company Name: Horner Electric
Address City IN Zip: 1521 East Washington Street Indianapolis, Indiana 46201
Reviewer: Kevin Leone
Date: December 1998

Table 1 - Emission Factors for Abrasives

	Emission Factor	
Abrasive	PM / lb abrasive	PM10 / lb PM
Sand	0.041	0.70
Grit	0.010	0.70
Steel Shot	0.004	0.86
Other	0.010	

Table 2 - Density of Abrasives (lb/ft3)

Abrasive	Density (lb/ft3)
Al oxides	160
Sand	99
Steel	487

Table 3 - Sand Flow Rate (FR1) Through Nozzle (lb/hr)

Flow rate of Sand Through a Blasting Nozzle as a Function of Nozzle pressure and Internal Diameter

	Nozzle Pressure (psig)							
Internal diame	30	40	50	60	70	80	90	100
1/8	28	35	42	49	55	63	70	77
3/16	65	80	94	107	122	135	149	165
1/4	109	138	168	195	221	255	280	309
5/16	205	247	292	354	377	420	462	507
3/8	285	355	417	477	540	600	657	720
7/16	385	472	560	645	755	820	905	940
1/2	503	615	725	835	945	1050	1160	1265
5/8	820	990	1170	1336	1510	1680	1850	2030
3/4	1140	1420	1670	1915	2160	2400	2630	2880
1	2030	2460	2900	3340	3780	4200	4640	5060

Calculations

Adjusting Flow Rates for Different Abrasives and Nozzle Diameters

Flow Rate (FR) = Abrasive flow rate (lb/hr) with internal nozzle diameter (ID)	
FR1 = Sand flow rate (lb/hr) with internal nozzle diameter (ID1) From Table 3 =	221
D = Density of abrasive (lb/ft3) From Table 2 =	155
D1 = Density of sand (lb/ft3) =	99
ID = Actual nozzle internal diameter (in) =	0.25
ID1 = Nozzle internal diameter (in) from Table 3 =	0.25

Flow Rate (FR) (lb/hr) = **346.010** per nozzle

Uncontrolled Emissions (E, lb/hr)

EF = emission factor (lb PM/ lb abrasive) From Table 1 =	0.010
FR = Flow Rate (lb/hr) =	346.010
w = fraction of time of wet blasting =	0 %
N = number of nozzles =	1

Uncontrolled Emissions =	**3.46 lb/hr**
	15.16 ton/yr

METHODOLOGY

Emission Factors from Stappa Alapco, Section 3 "Abrasive Blasting"
Ton/yr = lb/hr X 8760 hr/yr X ton/2000 lbs
Flow Rate (FR) (lb/hr) = FR1 x (ID/ID1)2 x (D/D1)
E = EF x FR x (1-w/200) x N

EU4 - Degreaser

Degreaser		Usage	Density	Precent	Potential VOC Emissions	
Substance		gal/day	lb/gal	VOC by Wt.	lbs/day	tons/yr
Trichloroethylene		12	12.18	100.00%	146.16	26.67

EU 7 - Varnish Tank #1

	lb VOC/gallon	gallons/year	lb VOC/year	ton VOC/year	ton HAP/year
Thermopoxy	4.42	220	972	0.49	
Xylene	7.18	57	272.8	0.14	0.14
Totals		277	1244.8	0.63	0.14

EU 8 - Varnish Tank #2

	lb VOC/gallon	gallons/year	lb VOC/year	ton VOC/year	ton HAP/year
Sterling	3.59	110	395	0.2	
Xylene	7.18	19	136	0.07	0.07
Totals		129	531	0.27	0.07

Both	0	406	1775.8	0.9	0.21

EU 9 - VPI Tank #1

	lb VOC/gallon	gallons/year	lb VOC/year	ton VOC/year
709A	3.8	1,930	7334	3.6
Totals		1,930	7334	3.6

EU 10 - VPI Tank #2

	lb VOC/gallon	gallons/year	lb VOC/year	ton VOC/year
709A	3.8	1,930	7334	3.6
Totals		1,930	7334	3.6

both	0	3860	14668	7.2

Stack gas conversions

S/V ID	Stack flow rate in scfm or cfm	Stack gas temp	acfm
1	300	1100	883.0189
2	390	1500	1442.264
3	100	70	100
4	500	450	858.4906
5	750	500	1358.491
6	200	500	362.2642
7	19300	70	19300
8	18000	70	18000

add columns as necessary

Sourcewide PTE	PM	PM-10	SO2	NOx	CO	VOC	HAPS Single	HAPS Combination
Paint Booth	1.68	1.68	0.00	0.00	0.00	11.40	0.78	3.13
Sandblaster	15.16							
Degreaser						26.67	26.67	26.67
Varnish Tanks						0.9	0.21	
VPI Tanks						7.2		
Total	16.84	1.68	0.00	0.00	0.00	46.18	27.67	29.80

Appendix A: Emissions Calculations
VOC and Particulate
From Surface Coating Operations

Company Name: Horner Electric
Address City IN Zip: 1521 East Washington Street, Indianapolis, Indiana 46201
Permit No.: T097-7787-00301
SIC: 3621 **Vent ID:** Emission Unit #6 (EU6)
Reviewer: K Leone
Date: December 1998

Potential to Emit (PTE)

Material	Density (Lb/Gal)	Weight % Volatile (H20& Organics)	Weight % Water	Weight % Organics	Volume % Water	Volume % Non-Vol (solids)	Gal of Mat (gal/unit)	Maximum (unit/hour)	Pounds VOC per gallon of coating less water	Pounds VOC per gallon of coating	Potential VOC pounds per hour	Potential VOC pounds per day	Potential VOC tons per year	Particulate Potential ton/yr	lb VOC /gal solids	Transfer Efficiency
#126 Heresite EP-6300 Coating	9.20	53.5%	0.0%	53.5%	0.0%	48.0%	0.0970	4.00	4.92	4.92	1.91	45.83	8.36	1.82	10.25	75%
#135 Elite Water Based Primer	9.60	55.0%	57.0%	55.0%	57.0%	67.0%	0.0970	4.00	5.03	5.28	2.05	49.17	8.97	1.84	7.88	75%
#102 Heresite S-330 Solvent	6.71	100.0%	0.0%	100.0%	0.0%	0.0%	0.0970	4.00	5.85	6.71	2.60	62.48	11.40	0.00	ERR	75%
t case coating, maximum units per hour and 8,760 hours/yr.											**2.60**	**62.48**	**11.40**	**1.68**		

(1) Data from Mfr's sheet

METHODOLOGY

Pounds of VOC per Gallon Coating less Water = (Density (lb/gal) * Weight % Organics) / (1-Volume % water)
Pounds of VOC per Gallon Coating = (Density (lb/gal) * Weight % Organics)
Potential VOC Pounds per Hour = Pounds of VOC per Gallon coating (lb/gal) * Gal of Material (gal/unit) * Maximum (units/hr)
Potential VOC Pounds per Day = Pounds of VOC per Gallon coating (lb/gal) * Gal of Material (gal/unit) * Maximum (units/hr) * (24 hr/day)
Potential VOC Tons per Year = Pounds of VOC per Gallon coating (lb/gal) * Gal of Material (gal/unit) * Maximum (units/hr) * (8760 hr/yr) * (1 ton/2000 lbs)
Particulate Potential Tons per Year = (units/hour) * (gal/unit) * (lbs/gal) * (1- Weight % Volatiles) * (1-Transfer efficiency) *(8760 hrs/yr) *(1 ton/2000 lbs)
Pounds VOC per Gallon of Solids = (Density (lbs/gal) * Weight % organics) / (Volume % solids)
Total = Worst Coating + Sum of all solvents used

Transfer efficiency was estimated at 75% for flat surface work and electrostatic air atomized, per "Air Pollution Engineering Manual" (AP-40), Table 2, page 362, 1992 edition.

Appendix A: Emissions Calculations
HAP Emission Calculations
From Surface Coating Operations

Company Name: Horner Electric
Address City IN Zip: 1521 East Washington Street, Indianapolis, Indiana 46201
Permit No.: T097-7787-00301
Vent ID: Emission Unit #6 (EU6)
Reviewer: K Leone
Date: December 1998

Material	Density (Lb/Gal)	Gal of Mat (gal/unit)	Maximum (unit/hour)	Weight % 2-Butoxyethanol (glycol ether)	Weight % Methyl Ethyl Ketone	Weight % Glycol Ethers	Weight % Toluene	Weight % Xylene	Weight % Methyl Isobutyl Ketone	Weight % Benzene	Weight % Ethylbenzene	2-Butoxyeth-onal (ton/yr) (glycol ether)	Methyl Ethyl Ketone (ton/yr)	Glycol Ethers (ton/yr)	Toluene (ton/yr)	Xylene (ton/yr)	Methyl Isobutyl Ketone (ton/yr)	Benzene (ton/yr)	Ethylbenzene (ton/yr)	Total Potential per coating (tons/yr)
#126 Heresite E	9.2	0.0970	4.00	0.0%	5.0%	0.0%	5.0%	5.0%	5.0%	0.0%	0.0%	0.00	0.78	0.00	0.78	0.78	0.78	0.00	0.00	3.13
#135 Elite Wate	9.6	0.0970	4.00	0.0%	5.0%	0.0%	2.0%	2.0%	5.0%	0.0%	0.0%	0.00	0.82	0.00	0.33	0.33	0.82	0.00	0.00	2.28
#102 Heresite S	6.71	0.0970	4.00	0.0%	0.0%	0.0%	2.0%	1.0%	0.0%	0.0%	0.0%	0.00	0.00	0.00	0.23	0.11	0.00	0.00	0.00	0.34
												0.00	0.76	0.00	**0.78**	**0.78**	0.08	0.00	0.00	**3.13**

* Determine Potential HAPs at Limited PTE: 249 tons VOC/yr x yr/292.31 tons VOC x 32.6 ton HAP = 27.77 tons HAP
State Potential Emissions based upon worst case HAP loading and 8,760 hr/yr.

METHODOLOGY
HAPS emission rate (tons/yr) = Density (lb/gal) * Gal of Material (gal/unit) * Maximum (unit/hr) * Weight % HAP * 8760 hrs/yr * 1 ton/2000 lbs

Appendix A: Emissions Calculations
VOC and Particulate
From Surface Coating Operations

Company Name: Horner Electric
Address City IN Zip: 1521 East Washington Street, Indianapolis, Indiana 46201
Permit No.: T097-7787-00301
Vent ID: Emission Unit #6 (EU6)
Reviewer: K Leone
Date: December 1998

	PM	PM-10	SO2	NOx	CO	VOC	HAPS Single	HAPS Combination
Paint Booth EU-17	1.68	1.68	0	0	0	11.40	0.78	3.13
Insignificant	0.00	0.00	0	0	0	0.00	0.00	0.00
Total Emissions	1.68	1.68	0	0	0	11.40	0.78	3.13

Appendix A: Emission Calculations

Abrasive Blasting

Company Name: Horner Electric
Address City IN Zip: 1521 East Washington Street Indianapolis, Indiana 46201
Reviewer: Kevin Leone
Date: December 1998

Table 1 - Emission Factors for Abrasives

	Emission Factor	
Abrasive	PM / lb abrasive	PM10 / lb PM
Sand	0.041	0.70
Grit	0.010	0.70
Steel Shot	0.004	0.86
Other	0.010	

Table 2 - Density of Abrasives (lb/ft3)

Abrasive	Density (lb/ft3)
Al oxides	160
Sand	99
Steel	487

Table 3 - Sand Flow Rate (FR1) Through Nozzle (lb/hr)

Flow rate of Sand Through a Blasting Nozzle as a Function of Nozzle pressure and Internal Diameter

	Nozzle Pressure (psig)							
Internal diame	30	40	50	60	70	80	90	100
1/8	28	35	42	49	55	63	70	77
3/16	65	80	94	107	122	135	149	165
1/4	109	138	168	195	221	255	280	309
5/16	205	247	292	354	377	420	462	507
3/8	285	355	417	477	540	600	657	720
7/16	385	472	560	645	755	820	905	940
1/2	503	615	725	835	945	1050	1160	1265
5/8	820	990	1170	1336	1510	1680	1850	2030
3/4	1140	1420	1670	1915	2160	2400	2630	2880
1	2030	2460	2900	3340	3780	4200	4640	5060

Calculations

Adjusting Flow Rates for Different Abrasives and Nozzle Diameters

Flow Rate (FR) = Abrasive flow rate (lb/hr) with internal nozzle diameter (ID)	
FR1 = Sand flow rate (lb/hr) with internal nozzle diameter (ID1) From Table 3 =	221
D = Density of abrasive (lb/ft3) From Table 2 =	155
D1 = Density of sand (lb/ft3) =	99
ID = Actual nozzle internal diameter (in) =	0.25
ID1 = Nozzle internal diameter (in) from Table 3 =	0.25

Flow Rate (FR) (lb/hr) = **346.010** per nozzle

Uncontrolled Emissions (E, lb/hr)

EF = emission factor (lb PM/ lb abrasive) From Table 1 =	0.010
FR = Flow Rate (lb/hr) =	346.010
w = fraction of time of wet blasting =	0 %
N = number of nozzles =	1

Uncontrolled Emissions =	**3.46 lb/hr**
	15.16 ton/yr

METHODOLOGY

Emission Factors from Stappa Alapco, Section 3 "Abrasive Blasting"
Ton/yr = lb/hr X 8760 hr/yr X ton/2000 lbs
Flow Rate (FR) (lb/hr) = FR1 x (ID/ID1)2 x (D/D1)
E = EF x FR x (1-w/200) x N

EU4 - Degreaser

Degreaser		Usage	Density	Precent	Potential VOC Emissions	
Substance		gal/day	lb/gal	VOC by Wt.	lbs/day	tons/yr
Trichloroethylene		12	12.18	100.00%	146.16	26.67

EU 7 - Varnish Tank #1

	lb VOC/gallon	gallons/year	lb VOC/year	ton VOC/year	ton HAP/year
Thermopoxy	4.42	220	972	0.49	
Xylene	7.18	57	272.8	0.14	0.14
Totals		277	1244.8	0.63	0.14

EU 8 - Varnish Tank #2

	lb VOC/gallon	gallons/year	lb VOC/year	ton VOC/year	ton HAP/year
Sterling	3.59	110	395	0.2	
Xylene	7.18	19	136	0.07	0.07
Totals		129	531	0.27	0.07

Both	0	406	1775.8	0.9	0.21

EU 9 - VPI Tank #1

	lb VOC/gallon	gallons/year	lb VOC/year	ton VOC/year
709A	3.8	1,930	7334	3.6
Totals		1,930	7334	3.6

EU 10 - VPI Tank #2

	lb VOC/gallon	gallons/year	lb VOC/year	ton VOC/year
709A	3.8	1,930	7334	3.6
Totals		1,930	7334	3.6

both	0	3860	14668	7.2

Stack gas conversions

S/V ID	Stack flow rate in scfm or cfm	Stack gas temp	acfm
1	300	1100	883.0189
2	390	1500	1442.264
3	100	70	100
4	500	450	858.4906
5	750	500	1358.491
6	200	500	362.2642
7	19300	70	19300
8	18000	70	18000

add columns as necessary

Sourcewide PTE	PM	PM-10	SO2	NOx	CO	VOC	HAPS Single	HAPS Combination
Paint Booth	1.68	1.68	0.00	0.00	0.00	11.40	0.78	3.13
Sandblaster	15.16							
Degreaser						26.67	26.67	26.67
Varnish Tanks						0.9	0.21	
VPI Tanks						7.2		
Total	16.84	1.68	0.00	0.00	0.00	46.18	27.67	29.80

Appendix A: Emissions Calculations
VOC and Particulate
From Surface Coating Operations

Company Name: Horner Electric
Address City IN Zip: 1521 East Washington Street, Indianapolis, Indiana 46201
Permit No.: T097-7787-00301
SIC: 3621 **Vent ID:** Emission Unit #6 (EU6)
Reviewer: K Leone
Date: December 1998

Potential to Emit (PTE)

Material	Density (Lb/Gal)	Weight % Volatile (H20& Organics)	Weight % Water	Weight % Organics	Volume % Water	Volume % Non-Vol (solids)	Gal of Mat (gal/unit)	Maximum (unit/hour)	Pounds VOC per gallon of coating less water	Pounds VOC per gallon of coating	Potential VOC pounds per hour	Potential VOC pounds per day	Potential VOC tons per year	Particulate Potential ton/yr	lb VOC /gal solids	Transfer Efficiency
#126 Heresite EP-6300 Coating	9.20	53.5%	0.0%	53.5%	0.0%	48.0%	0.0970	4.00	4.92	4.92	1.91	45.83	8.36	1.82	10.25	75%
#135 Elite Water Based Primer	9.60	55.0%	57.0%	55.0%	57.0%	67.0%	0.0970	4.00	5.03	5.28	2.05	49.17	8.97	1.84	7.88	75%
#102 Heresite S-330 Solvent	6.71	100.0%	0.0%	100.0%	0.0%	0.0%	0.0970	4.00	5.85	6.71	2.60	62.48	11.40	0.00	ERR	75%
t case coating, maximum units per hour and 8,760 hours/yr.											**2.60**	**62.48**	**11.40**	**1.68**		

(1) Data from Mfr's sheet

METHODOLOGY

Pounds of VOC per Gallon Coating less Water = (Density (lb/gal) * Weight % Organics) / (1-Volume % water)
Pounds of VOC per Gallon Coating = (Density (lb/gal) * Weight % Organics)
Potential VOC Pounds per Hour = Pounds of VOC per Gallon coating (lb/gal) * Gal of Material (gal/unit) * Maximum (units/hr)
Potential VOC Pounds per Day = Pounds of VOC per Gallon coating (lb/gal) * Gal of Material (gal/unit) * Maximum (units/hr) * (24 hr/day)
Potential VOC Tons per Year = Pounds of VOC per Gallon coating (lb/gal) * Gal of Material (gal/unit) * Maximum (units/hr) * (8760 hr/yr) * (1 ton/2000 lbs)
Particulate Potential Tons per Year = (units/hour) * (gal/unit) * (lbs/gal) * (1- Weight % Volatiles) * (1-Transfer efficiency) *(8760 hrs/yr) *(1 ton/2000 lbs)
Pounds VOC per Gallon of Solids = (Density (lbs/gal) * Weight % organics) / (Volume % solids)
Total = Worst Coating + Sum of all solvents used

Transfer efficiency was estimated at 75% for flat surface work and electrostatic air atomized, per "Air Pollution Engineering Manual" (AP-40), Table 2, page 362, 1992 edition.

Appendix A: Emissions Calculations
HAP Emission Calculations
From Surface Coating Operations

Company Name: Horner Electric
Address City IN Zip: 1521 East Washington Street, Indianapolis, Indiana 46201
Permit No.: T097-7787-00301
Vent ID: Emission Unit #6 (EU6)
Reviewer: K Leone
Date: December 1998

Material	Density (Lb/Gal)	Gal of Mat (gal/unit)	Maximum (unit/hour)	Weight % 2-Butoxyethanol (glycol ether)	Weight % Methyl Ethyl Ketone	Weight % Glycol Ethers	Weight % Toluene	Weight % Xylene	Weight % Methyl Isobutyl Ketone	Weight % Benzene	Weight % Ethylbenzene	2-Butoxyeth-onal (ton/yr) (glycol ether)	Methyl Ethyl Ketone (ton/yr)	Glycol Ethers (ton/yr)	Toluene (ton/yr)	Xylene (ton/yr)	Methyl Isobutyl Ketone (ton/yr)	Benzene (ton/yr)	Ethylbenzene (ton/yr)	Total Potential per coating (tons/yr)
#126 Heresite E	9.2	0.0970	4.00	0.0%	5.0%	0.0%	5.0%	5.0%	5.0%	0.0%	0.0%	0.00	0.78	0.00	0.78	0.78	0.78	0.00	0.00	3.13
#135 Elite Wate	9.6	0.0970	4.00	0.0%	5.0%	0.0%	2.0%	2.0%	5.0%	0.0%	0.0%	0.00	0.82	0.00	0.33	0.33	0.82	0.00	0.00	2.28
#102 Heresite S	6.71	0.0970	4.00	0.0%	0.0%	0.0%	2.0%	1.0%	0.0%	0.0%	0.0%	0.00	0.00	0.00	0.23	0.11	0.00	0.00	0.00	0.34
												0.00	0.76	0.00	**0.78**	**0.78**	0.08	0.00	0.00	**3.13**

* Determine Potential HAPs at Limited PTE: 249 tons VOC/yr x yr/292.31 tons VOC x 32.6 ton HAP = 27.77 tons HAP
State Potential Emissions based upon worst case HAP loading and 8,760 hr/yr.

METHODOLOGY
HAPS emission rate (tons/yr) = Density (lb/gal) * Gal of Material (gal/unit) * Maximum (unit/hr) * Weight % HAP * 8760 hrs/yr * 1 ton/2000 lbs

Appendix A: Emissions Calculations
VOC and Particulate
From Surface Coating Operations

Company Name: Horner Electric
Address City IN Zip: 1521 East Washington Street, Indianapolis, Indiana 46201
Permit No.: T097-7787-00301
Vent ID: Emission Unit #6 (EU6)
Reviewer: K Leone
Date: December 1998

	PM	PM-10	SO2	NOx	CO	VOC	HAPS Single	HAPS Combination
Paint Booth EU-17	1.68	1.68	0	0	0	11.40	0.78	3.13
Insignificant	0.00	0.00	0	0	0	0.00	0.00	0.00
Total Emissions	1.68	1.68	0	0	0	11.40	0.78	3.13

Appendix A: Emission Calculations

Abrasive Blasting

Company Name: Horner Electric
Address City IN Zip: 1521 East Washington Street Indianapolis, Indiana 46201
Reviewer: Kevin Leone
Date: December 1998

Table 1 - Emission Factors for Abrasives

	Emission Factor	
Abrasive	PM / lb abrasive	PM10 / lb PM
Sand	0.041	0.70
Grit	0.010	0.70
Steel Shot	0.004	0.86
Other	0.010	

Table 2 - Density of Abrasives (lb/ft3)

Abrasive	Density (lb/ft3)
Al oxides	160
Sand	99
Steel	487

Table 3 - Sand Flow Rate (FR1) Through Nozzle (lb/hr)

Flow rate of Sand Through a Blasting Nozzle as a Function of Nozzle pressure and Internal Diameter

	Nozzle Pressure (psig)							
Internal diame	30	40	50	60	70	80	90	100
1/8	28	35	42	49	55	63	70	77
3/16	65	80	94	107	122	135	149	165
1/4	109	138	168	195	221	255	280	309
5/16	205	247	292	354	377	420	462	507
3/8	285	355	417	477	540	600	657	720
7/16	385	472	560	645	755	820	905	940
1/2	503	615	725	835	945	1050	1160	1265
5/8	820	990	1170	1336	1510	1680	1850	2030
3/4	1140	1420	1670	1915	2160	2400	2630	2880
1	2030	2460	2900	3340	3780	4200	4640	5060

Calculations

Adjusting Flow Rates for Different Abrasives and Nozzle Diameters

Flow Rate (FR) = Abrasive flow rate (lb/hr) with internal nozzle diameter (ID)	
FR1 = Sand flow rate (lb/hr) with internal nozzle diameter (ID1) From Table 3 =	221
D = Density of abrasive (lb/ft3) From Table 2 =	155
D1 = Density of sand (lb/ft3) =	99
ID = Actual nozzle internal diameter (in) =	0.25
ID1 = Nozzle internal diameter (in) from Table 3 =	0.25

Flow Rate (FR) (lb/hr) = **346.010** per nozzle

Uncontrolled Emissions (E, lb/hr)

EF = emission factor (lb PM/ lb abrasive) From Table 1 =	0.010
FR = Flow Rate (lb/hr) =	346.010
w = fraction of time of wet blasting =	0 %
N = number of nozzles =	1

Uncontrolled Emissions =	**3.46 lb/hr**
	15.16 ton/yr

METHODOLOGY

Emission Factors from Stappa Alapco, Section 3 "Abrasive Blasting"
Ton/yr = lb/hr X 8760 hr/yr X ton/2000 lbs
Flow Rate (FR) (lb/hr) = FR1 x (ID/ID1)2 x (D/D1)
E = EF x FR x (1-w/200) x N

EU4 - Degreaser

Degreaser		Usage	Density	Precent	Potential VOC Emissions	
Substance		gal/day	lb/gal	VOC by Wt.	lbs/day	tons/yr
Trichloroethylene		12	12.18	100.00%	146.16	26.67

EU 7 - Varnish Tank #1

	lb VOC/gallon	gallons/year	lb VOC/year	ton VOC/year	ton HAP/year
Thermopoxy	4.42	220	972	0.49	
Xylene	7.18	57	272.8	0.14	0.14
Totals		277	1244.8	0.63	0.14

EU 8 - Varnish Tank #2

	lb VOC/gallon	gallons/year	lb VOC/year	ton VOC/year	ton HAP/year
Sterling	3.59	110	395	0.2	
Xylene	7.18	19	136	0.07	0.07
Totals		129	531	0.27	0.07

Both	0	406	1775.8	0.9	0.21

EU 9 - VPI Tank #1

	lb VOC/gallon	gallons/year	lb VOC/year	ton VOC/year
709A	3.8	1,930	7334	3.6
Totals		1,930	7334	3.6

EU 10 - VPI Tank #2

	lb VOC/gallon	gallons/year	lb VOC/year	ton VOC/year
709A	3.8	1,930	7334	3.6
Totals		1,930	7334	3.6

both	0	3860	14668	7.2

Stack gas conversions

S/V ID	Stack flow rate in scfm or cfm	Stack gas temp	acfm
1	300	1100	883.0189
2	390	1500	1442.264
3	100	70	100
4	500	450	858.4906
5	750	500	1358.491
6	200	500	362.2642
7	19300	70	19300
8	18000	70	18000

add columns as necessary

Sourcewide PTE	PM	PM-10	SO2	NOx	CO	VOC	HAPS Single	HAPS Combination
Paint Booth	1.68	1.68	0.00	0.00	0.00	11.40	0.78	3.13
Sandblaster	15.16							
Degreaser						26.67	26.67	26.67
Varnish Tanks						0.9	0.21	
VPI Tanks						7.2		
Total	16.84	1.68	0.00	0.00	0.00	46.18	27.67	29.80

Appendix A: Emissions Calculations
VOC and Particulate
From Surface Coating Operations

Company Name: Horner Electric
Address City IN Zip: 1521 East Washington Street, Indianapolis, Indiana 46201
Permit No.: T097-7787-00301
SIC: 3621 **Vent ID:** Emission Unit #6 (EU6)
Reviewer: K Leone
Date: December 1998

Potential to Emit (PTE)

Material	Density (Lb/Gal)	Weight % Volatile (H20& Organics)	Weight % Water	Weight % Organics	Volume % Water	Volume % Non-Vol (solids)	Gal of Mat (gal/unit)	Maximum (unit/hour)	Pounds VOC per gallon of coating less water	Pounds VOC per gallon of coating	Potential VOC pounds per hour	Potential VOC pounds per day	Potential VOC tons per year	Particulate Potential ton/yr	lb VOC /gal solids	Transfer Efficiency
#126 Heresite EP-6300 Coating	9.20	53.5%	0.0%	53.5%	0.0%	48.0%	0.0970	4.00	4.92	4.92	1.91	45.83	8.36	1.82	10.25	75%
#135 Elite Water Based Primer	9.60	55.0%	57.0%	55.0%	57.0%	67.0%	0.0970	4.00	5.03	5.28	2.05	49.17	8.97	1.84	7.88	75%
#102 Heresite S-330 Solvent	6.71	100.0%	0.0%	100.0%	0.0%	0.0%	0.0970	4.00	5.85	6.71	2.60	62.48	11.40	0.00	ERR	75%
t case coating, maximum units per hour and 8,760 hours/yr.											**2.60**	**62.48**	**11.40**	**1.68**		

(1) Data from Mfr's sheet

METHODOLOGY

Pounds of VOC per Gallon Coating less Water = (Density (lb/gal) * Weight % Organics) / (1-Volume % water)
Pounds of VOC per Gallon Coating = (Density (lb/gal) * Weight % Organics)
Potential VOC Pounds per Hour = Pounds of VOC per Gallon coating (lb/gal) * Gal of Material (gal/unit) * Maximum (units/hr)
Potential VOC Pounds per Day = Pounds of VOC per Gallon coating (lb/gal) * Gal of Material (gal/unit) * Maximum (units/hr) * (24 hr/day)
Potential VOC Tons per Year = Pounds of VOC per Gallon coating (lb/gal) * Gal of Material (gal/unit) * Maximum (units/hr) * (8760 hr/yr) * (1 ton/2000 lbs)
Particulate Potential Tons per Year = (units/hour) * (gal/unit) * (lbs/gal) * (1- Weight % Volatiles) * (1-Transfer efficiency) *(8760 hrs/yr) *(1 ton/2000 lbs)
Pounds VOC per Gallon of Solids = (Density (lbs/gal) * Weight % organics) / (Volume % solids)
Total = Worst Coating + Sum of all solvents used

Transfer efficiency was estimated at 75% for flat surface work and electrostatic air atomized, per "Air Pollution Engineering Manual" (AP-40), Table 2, page 362, 1992 edition.

Appendix A: Emissions Calculations
HAP Emission Calculations
From Surface Coating Operations

Company Name: Horner Electric
Address City IN Zip: 1521 East Washington Street, Indianapolis, Indiana 46201
Permit No.: T097-7787-00301
Vent ID: Emission Unit #6 (EU6)
Reviewer: K Leone
Date: December 1998

Material	Density (Lb/Gal)	Gal of Mat (gal/unit)	Maximum (unit/hour)	Weight % 2-Butoxyethanol (glycol ether)	Weight % Methyl Ethyl Ketone	Weight % Glycol Ethers	Weight % Toluene	Weight % Xylene	Weight % Methyl Isobutyl Ketone	Weight % Benzene	Weight % Ethylbenzene	2-Butoxyeth-onal (ton/yr) (glycol ether)	Methyl Ethyl Ketone (ton/yr)	Glycol Ethers (ton/yr)	Toluene (ton/yr)	Xylene (ton/yr)	Methyl Isobutyl Ketone (ton/yr)	Benzene (ton/yr)	Ethylbenzene (ton/yr)	Total Potential per coating (tons/yr)
#126 Heresite E	9.2	0.0970	4.00	0.0%	5.0%	0.0%	5.0%	5.0%	5.0%	0.0%	0.0%	0.00	0.78	0.00	0.78	0.78	0.78	0.00	0.00	3.13
#135 Elite Wate	9.6	0.0970	4.00	0.0%	5.0%	0.0%	2.0%	2.0%	5.0%	0.0%	0.0%	0.00	0.82	0.00	0.33	0.33	0.82	0.00	0.00	2.28
#102 Heresite S	6.71	0.0970	4.00	0.0%	0.0%	0.0%	2.0%	1.0%	0.0%	0.0%	0.0%	0.00	0.00	0.00	0.23	0.11	0.00	0.00	0.00	0.34
												0.00	0.76	0.00	**0.78**	**0.78**	0.08	0.00	0.00	**3.13**

* Determine Potential HAPs at Limited PTE: 249 tons VOC/yr x yr/292.31 tons VOC x 32.6 ton HAP = 27.77 tons HAP
State Potential Emissions based upon worst case HAP loading and 8,760 hr/yr.

METHODOLOGY
HAPS emission rate (tons/yr) = Density (lb/gal) * Gal of Material (gal/unit) * Maximum (unit/hr) * Weight % HAP * 8760 hrs/yr * 1 ton/2000 lbs

Appendix A: Emissions Calculations
VOC and Particulate
From Surface Coating Operations

Company Name: Horner Electric
Address City IN Zip: 1521 East Washington Street, Indianapolis, Indiana 46201
Permit No.: T097-7787-00301
Vent ID: Emission Unit #6 (EU6)
Reviewer: K Leone
Date: December 1998

	PM	PM-10	SO2	NOx	CO	VOC	HAPS Single	HAPS Combination
Paint Booth EU-17	1.68	1.68	0	0	0	11.40	0.78	3.13
Insignificant	0.00	0.00	0	0	0	0.00	0.00	0.00
Total Emissions	1.68	1.68	0	0	0	11.40	0.78	3.13

Appendix A: Emission Calculations

Abrasive Blasting

Company Name: Horner Electric
Address City IN Zip: 1521 East Washington Street Indianapolis, Indiana 46201
Reviewer: Kevin Leone
Date: December 1998

Table 1 - Emission Factors for Abrasives

	Emission Factor	
Abrasive	PM / lb abrasive	PM10 / lb PM
Sand	0.041	0.70
Grit	0.010	0.70
Steel Shot	0.004	0.86
Other	0.010	

Table 2 - Density of Abrasives (lb/ft3)

Abrasive	Density (lb/ft3)
Al oxides	160
Sand	99
Steel	487

Table 3 - Sand Flow Rate (FR1) Through Nozzle (lb/hr)

Flow rate of Sand Through a Blasting Nozzle as a Function of Nozzle pressure and Internal Diameter

	Nozzle Pressure (psig)							
Internal diame	30	40	50	60	70	80	90	100
1/8	28	35	42	49	55	63	70	77
3/16	65	80	94	107	122	135	149	165
1/4	109	138	168	195	221	255	280	309
5/16	205	247	292	354	377	420	462	507
3/8	285	355	417	477	540	600	657	720
7/16	385	472	560	645	755	820	905	940
1/2	503	615	725	835	945	1050	1160	1265
5/8	820	990	1170	1336	1510	1680	1850	2030
3/4	1140	1420	1670	1915	2160	2400	2630	2880
1	2030	2460	2900	3340	3780	4200	4640	5060

Calculations

Adjusting Flow Rates for Different Abrasives and Nozzle Diameters

Flow Rate (FR) = Abrasive flow rate (lb/hr) with internal nozzle diameter (ID)	
FR1 = Sand flow rate (lb/hr) with internal nozzle diameter (ID1) From Table 3 =	221
D = Density of abrasive (lb/ft3) From Table 2 =	155
D1 = Density of sand (lb/ft3) =	99
ID = Actual nozzle internal diameter (in) =	0.25
ID1 = Nozzle internal diameter (in) from Table 3 =	0.25

Flow Rate (FR) (lb/hr) = **346.010** per nozzle

Uncontrolled Emissions (E, lb/hr)

EF = emission factor (lb PM/ lb abrasive) From Table 1 =	0.010
FR = Flow Rate (lb/hr) =	346.010
w = fraction of time of wet blasting =	0 %
N = number of nozzles =	1

Uncontrolled Emissions =	**3.46 lb/hr**
	15.16 ton/yr

METHODOLOGY

Emission Factors from Stappa Alapco, Section 3 "Abrasive Blasting"
Ton/yr = lb/hr X 8760 hr/yr X ton/2000 lbs
Flow Rate (FR) (lb/hr) = FR1 x (ID/ID1)2 x (D/D1)
E = EF x FR x (1-w/200) x N

EU4 - Degreaser

Degreaser		Usage	Density	Precent	Potential VOC Emissions	
Substance		gal/day	lb/gal	VOC by Wt.	lbs/day	tons/yr
Trichloroethylene		12	12.18	100.00%	146.16	26.67

EU 7 - Varnish Tank #1

	lb VOC/gallon	gallons/year	lb VOC/year	ton VOC/year	ton HAP/year
Thermopoxy	4.42	220	972	0.49	
Xylene	7.18	57	272.8	0.14	0.14
Totals		277	1244.8	0.63	0.14

EU 8 - Varnish Tank #2

	lb VOC/gallon	gallons/year	lb VOC/year	ton VOC/year	ton HAP/year
Sterling	3.59	110	395	0.2	
Xylene	7.18	19	136	0.07	0.07
Totals		129	531	0.27	0.07

Both	0	406	1775.8	0.9	0.21

EU 9 - VPI Tank #1

	lb VOC/gallon	gallons/year	lb VOC/year	ton VOC/year
709A	3.8	1,930	7334	3.6
Totals		1,930	7334	3.6

EU 10 - VPI Tank #2

	lb VOC/gallon	gallons/year	lb VOC/year	ton VOC/year
709A	3.8	1,930	7334	3.6
Totals		1,930	7334	3.6

both	0	3860	14668	7.2

Stack gas conversions

S/V ID	Stack flow rate in scfm or cfm	Stack gas temp	acfm
1	300	1100	883.0189
2	390	1500	1442.264
3	100	70	100
4	500	450	858.4906
5	750	500	1358.491
6	200	500	362.2642
7	19300	70	19300
8	18000	70	18000

add columns as necessary

Sourcewide PTE	PM	PM-10	SO2	NOx	CO	VOC	HAPS Single	HAPS Combination
Paint Booth	1.68	1.68	0.00	0.00	0.00	11.40	0.78	3.13
Sandblaster	15.16							
Degreaser						26.67	26.67	26.67
Varnish Tanks						0.9	0.21	
VPI Tanks						7.2		
Total	16.84	1.68	0.00	0.00	0.00	46.18	27.67	29.80

Appendix A: Emissions Calculations
VOC and Particulate
From Surface Coating Operations

Company Name: Horner Electric
Address City IN Zip: 1521 East Washington Street, Indianapolis, Indiana 46201
Permit No.: T097-7787-00301
SIC: 3621 **Vent ID:** Emission Unit #6 (EU6)
Reviewer: K Leone
Date: December 1998

Potential to Emit (PTE)

Material	Density (Lb/Gal)	Weight % Volatile (H20& Organics)	Weight % Water	Weight % Organics	Volume % Water	Volume % Non-Vol (solids)	Gal of Mat (gal/unit)	Maximum (unit/hour)	Pounds VOC per gallon of coating less water	Pounds VOC per gallon of coating	Potential VOC pounds per hour	Potential VOC pounds per day	Potential VOC tons per year	Particulate Potential ton/yr	lb VOC /gal solids	Transfer Efficiency
#126 Heresite EP-6300 Coating	9.20	53.5%	0.0%	53.5%	0.0%	48.0%	0.0970	4.00	4.92	4.92	1.91	45.83	8.36	1.82	10.25	75%
#135 Elite Water Based Primer	9.60	55.0%	57.0%	55.0%	57.0%	67.0%	0.0970	4.00	5.03	5.28	2.05	49.17	8.97	1.84	7.88	75%
#102 Heresite S-330 Solvent	6.71	100.0%	0.0%	100.0%	0.0%	0.0%	0.0970	4.00	5.85	6.71	2.60	62.48	11.40	0.00	ERR	75%
t case coating, maximum units per hour and 8,760 hours/yr.											**2.60**	**62.48**	**11.40**	**1.68**		

(1) Data from Mfr's sheet

METHODOLOGY

Pounds of VOC per Gallon Coating less Water = (Density (lb/gal) * Weight % Organics) / (1-Volume % water)
Pounds of VOC per Gallon Coating = (Density (lb/gal) * Weight % Organics)
Potential VOC Pounds per Hour = Pounds of VOC per Gallon coating (lb/gal) * Gal of Material (gal/unit) * Maximum (units/hr)
Potential VOC Pounds per Day = Pounds of VOC per Gallon coating (lb/gal) * Gal of Material (gal/unit) * Maximum (units/hr) * (24 hr/day)
Potential VOC Tons per Year = Pounds of VOC per Gallon coating (lb/gal) * Gal of Material (gal/unit) * Maximum (units/hr) * (8760 hr/yr) * (1 ton/2000 lbs)
Particulate Potential Tons per Year = (units/hour) * (gal/unit) * (lbs/gal) * (1- Weight % Volatiles) * (1-Transfer efficiency) *(8760 hrs/yr) *(1 ton/2000 lbs)
Pounds VOC per Gallon of Solids = (Density (lbs/gal) * Weight % organics) / (Volume % solids)
Total = Worst Coating + Sum of all solvents used

Transfer efficiency was estimated at 75% for flat surface work and electrostatic air atomized, per "Air Pollution Engineering Manual" (AP-40), Table 2, page 362, 1992 edition.

Appendix A: Emissions Calculations
HAP Emission Calculations
From Surface Coating Operations

Company Name: Horner Electric
Address City IN Zip: 1521 East Washington Street, Indianapolis, Indiana 46201
Permit No.: T097-7787-00301
Vent ID: Emission Unit #6 (EU6)
Reviewer: K Leone
Date: December 1998

Material	Density (Lb/Gal)	Gal of Mat (gal/unit)	Maximum (unit/hour)	Weight % 2-Butoxyethanol (glycol ether)	Weight % Methyl Ethyl Ketone	Weight % Glycol Ethers	Weight % Toluene	Weight % Xylene	Weight % Methyl Isobutyl Ketone	Weight % Benzene	Weight % Ethylbenzene	2-Butoxyeth-onal (ton/yr) (glycol ether)	Methyl Ethyl Ketone (ton/yr)	Glycol Ethers (ton/yr)	Toluene (ton/yr)	Xylene (ton/yr)	Methyl Isobutyl Ketone (ton/yr)	Benzene (ton/yr)	Ethylbenzene (ton/yr)	Total Potential per coating (tons/yr)
#126 Heresite E	9.2	0.0970	4.00	0.0%	5.0%	0.0%	5.0%	5.0%	5.0%	0.0%	0.0%	0.00	0.78	0.00	0.78	0.78	0.78	0.00	0.00	3.13
#135 Elite Wate	9.6	0.0970	4.00	0.0%	5.0%	0.0%	2.0%	2.0%	5.0%	0.0%	0.0%	0.00	0.82	0.00	0.33	0.33	0.82	0.00	0.00	2.28
#102 Heresite S	6.71	0.0970	4.00	0.0%	0.0%	0.0%	2.0%	1.0%	0.0%	0.0%	0.0%	0.00	0.00	0.00	0.23	0.11	0.00	0.00	0.00	0.34
												0.00	0.76	0.00	**0.78**	**0.78**	0.08	0.00	0.00	**3.13**

* Determine Potential HAPs at Limited PTE: 249 tons VOC/yr x yr/292.31 tons VOC x 32.6 ton HAP = 27.77 tons HAP
State Potential Emissions based upon worst case HAP loading and 8,760 hr/yr.

METHODOLOGY
HAPS emission rate (tons/yr) = Density (lb/gal) * Gal of Material (gal/unit) * Maximum (unit/hr) * Weight % HAP * 8760 hrs/yr * 1 ton/2000 lbs

Appendix A: Emissions Calculations
VOC and Particulate
From Surface Coating Operations

Company Name: Horner Electric
Address City IN Zip: 1521 East Washington Street, Indianapolis, Indiana 46201
Permit No.: T097-7787-00301
Vent ID: Emission Unit #6 (EU6)
Reviewer: K Leone
Date: December 1998

	PM	PM-10	SO2	NOx	CO	VOC	HAPS Single	HAPS Combination
Paint Booth EU-17	1.68	1.68	0	0	0	11.40	0.78	3.13
Insignificant	0.00	0.00	0	0	0	0.00	0.00	0.00
Total Emissions	1.68	1.68	0	0	0	11.40	0.78	3.13

Appendix A: Emission Calculations

Abrasive Blasting

Company Name: Horner Electric
Address City IN Zip: 1521 East Washington Street Indianapolis, Indiana 46201
Reviewer: Kevin Leone
Date: December 1998

Table 1 - Emission Factors for Abrasives

	Emission Factor	
Abrasive	PM / lb abrasive	PM10 / lb PM
Sand	0.041	0.70
Grit	0.010	0.70
Steel Shot	0.004	0.86
Other	0.010	

Table 2 - Density of Abrasives (lb/ft3)

Abrasive	Density (lb/ft3)
Al oxides	160
Sand	99
Steel	487

Table 3 - Sand Flow Rate (FR1) Through Nozzle (lb/hr)

Flow rate of Sand Through a Blasting Nozzle as a Function of Nozzle pressure and Internal Diameter

	Nozzle Pressure (psig)							
Internal diame	30	40	50	60	70	80	90	100
1/8	28	35	42	49	55	63	70	77
3/16	65	80	94	107	122	135	149	165
1/4	109	138	168	195	221	255	280	309
5/16	205	247	292	354	377	420	462	507
3/8	285	355	417	477	540	600	657	720
7/16	385	472	560	645	755	820	905	940
1/2	503	615	725	835	945	1050	1160	1265
5/8	820	990	1170	1336	1510	1680	1850	2030
3/4	1140	1420	1670	1915	2160	2400	2630	2880
1	2030	2460	2900	3340	3780	4200	4640	5060

Calculations

Adjusting Flow Rates for Different Abrasives and Nozzle Diameters

Flow Rate (FR) = Abrasive flow rate (lb/hr) with internal nozzle diameter (ID)	
FR1 = Sand flow rate (lb/hr) with internal nozzle diameter (ID1) From Table 3 =	221
D = Density of abrasive (lb/ft3) From Table 2 =	155
D1 = Density of sand (lb/ft3) =	99
ID = Actual nozzle internal diameter (in) =	0.25
ID1 = Nozzle internal diameter (in) from Table 3 =	0.25

Flow Rate (FR) (lb/hr) = **346.010** per nozzle

Uncontrolled Emissions (E, lb/hr)

EF = emission factor (lb PM/ lb abrasive) From Table 1 =	0.010
FR = Flow Rate (lb/hr) =	346.010
w = fraction of time of wet blasting =	0 %
N = number of nozzles =	1

Uncontrolled Emissions =	**3.46 lb/hr**
	15.16 ton/yr

METHODOLOGY

Emission Factors from Stappa Alapco, Section 3 "Abrasive Blasting"
Ton/yr = lb/hr X 8760 hr/yr X ton/2000 lbs
Flow Rate (FR) (lb/hr) = FR1 x (ID/ID1)2 x (D/D1)
E = EF x FR x (1-w/200) x N

EU4 - Degreaser

Degreaser		Usage	Density	Precent	Potential VOC Emissions	
Substance		gal/day	lb/gal	VOC by Wt.	lbs/day	tons/yr
Trichloroethylene		12	12.18	100.00%	146.16	26.67

EU 7 - Varnish Tank #1

	lb VOC/gallon	gallons/year	lb VOC/year	ton VOC/year	ton HAP/year
Thermopoxy	4.42	220	972	0.49	
Xylene	7.18	57	272.8	0.14	0.14
Totals		277	1244.8	0.63	0.14

EU 8 - Varnish Tank #2

	lb VOC/gallon	gallons/year	lb VOC/year	ton VOC/year	ton HAP/year
Sterling	3.59	110	395	0.2	
Xylene	7.18	19	136	0.07	0.07
Totals		129	531	0.27	0.07

Both	0	406	1775.8	0.9	0.21

EU 9 - VPI Tank #1

	lb VOC/gallon	gallons/year	lb VOC/year	ton VOC/year
709A	3.8	1,930	7334	3.6
Totals		1,930	7334	3.6

EU 10 - VPI Tank #2

	lb VOC/gallon	gallons/year	lb VOC/year	ton VOC/year
709A	3.8	1,930	7334	3.6
Totals		1,930	7334	3.6

both	0	3860	14668	7.2

Stack gas conversions

S/V ID	Stack flow rate in scfm or cfm	Stack gas temp	acfm
1	300	1100	883.0189
2	390	1500	1442.264
3	100	70	100
4	500	450	858.4906
5	750	500	1358.491
6	200	500	362.2642
7	19300	70	19300
8	18000	70	18000

add columns as necessary

Sourcewide PTE	PM	PM-10	SO2	NOx	CO	VOC	HAPS Single	HAPS Combination
Paint Booth	1.68	1.68	0.00	0.00	0.00	11.40	0.78	3.13
Sandblaster	15.16							
Degreaser						26.67	26.67	26.67
Varnish Tanks						0.9	0.21	
VPI Tanks						7.2		
Total	16.84	1.68	0.00	0.00	0.00	46.18	27.67	29.80

Appendix A: Emissions Calculations
VOC and Particulate
From Surface Coating Operations

Company Name: Horner Electric
Address City IN Zip: 1521 East Washington Street, Indianapolis, Indiana 46201
Permit No.: T097-7787-00301
SIC: 3621 **Vent ID:** Emission Unit #6 (EU6)
Reviewer: K Leone
Date: December 1998

Potential to Emit (PTE)

Material	Density (Lb/Gal)	Weight % Volatile (H20& Organics)	Weight % Water	Weight % Organics	Volume % Water	Volume % Non-Vol (solids)	Gal of Mat (gal/unit)	Maximum (unit/hour)	Pounds VOC per gallon of coating less water	Pounds VOC per gallon of coating	Potential VOC pounds per hour	Potential VOC pounds per day	Potential VOC tons per year	Particulate Potential ton/yr	lb VOC /gal solids	Transfer Efficiency
#126 Heresite EP-6300 Coating	9.20	53.5%	0.0%	53.5%	0.0%	48.0%	0.0970	4.00	4.92	4.92	1.91	45.83	8.36	1.82	10.25	75%
#135 Elite Water Based Primer	9.60	55.0%	57.0%	55.0%	57.0%	67.0%	0.0970	4.00	5.03	5.28	2.05	49.17	8.97	1.84	7.88	75%
#102 Heresite S-330 Solvent	6.71	100.0%	0.0%	100.0%	0.0%	0.0%	0.0970	4.00	5.85	6.71	2.60	62.48	11.40	0.00	ERR	75%
t case coating, maximum units per hour and 8,760 hours/yr.											**2.60**	**62.48**	**11.40**	**1.68**		

(1) Data from Mfr's sheet

METHODOLOGY

Pounds of VOC per Gallon Coating less Water = (Density (lb/gal) * Weight % Organics) / (1-Volume % water)
Pounds of VOC per Gallon Coating = (Density (lb/gal) * Weight % Organics)
Potential VOC Pounds per Hour = Pounds of VOC per Gallon coating (lb/gal) * Gal of Material (gal/unit) * Maximum (units/hr)
Potential VOC Pounds per Day = Pounds of VOC per Gallon coating (lb/gal) * Gal of Material (gal/unit) * Maximum (units/hr) * (24 hr/day)
Potential VOC Tons per Year = Pounds of VOC per Gallon coating (lb/gal) * Gal of Material (gal/unit) * Maximum (units/hr) * (8760 hr/yr) * (1 ton/2000 lbs)
Particulate Potential Tons per Year = (units/hour) * (gal/unit) * (lbs/gal) * (1- Weight % Volatiles) * (1-Transfer efficiency) *(8760 hrs/yr) *(1 ton/2000 lbs)
Pounds VOC per Gallon of Solids = (Density (lbs/gal) * Weight % organics) / (Volume % solids)
Total = Worst Coating + Sum of all solvents used

Transfer efficiency was estimated at 75% for flat surface work and electrostatic air atomized, per "Air Pollution Engineering Manual" (AP-40), Table 2, page 362, 1992 edition.

Appendix A: Emissions Calculations
HAP Emission Calculations
From Surface Coating Operations

Company Name: Horner Electric
Address City IN Zip: 1521 East Washington Street, Indianapolis, Indiana 46201
Permit No.: T097-7787-00301
Vent ID: Emission Unit #6 (EU6)
Reviewer: K Leone
Date: December 1998

Material	Density (Lb/Gal)	Gal of Mat (gal/unit)	Maximum (unit/hour)	Weight % 2-Butoxyethanol (glycol ether)	Weight % Methyl Ethyl Ketone	Weight % Glycol Ethers	Weight % Toluene	Weight % Xylene	Weight % Methyl Isobutyl Ketone	Weight % Benzene	Weight % Ethylbenzene	2-Butoxyeth-onal (ton/yr) (glycol ether)	Methyl Ethyl Ketone (ton/yr)	Glycol Ethers (ton/yr)	Toluene (ton/yr)	Xylene (ton/yr)	Methyl Isobutyl Ketone (ton/yr)	Benzene (ton/yr)	Ethylbenzene (ton/yr)	Total Potential per coating (tons/yr)
#126 Heresite E	9.2	0.0970	4.00	0.0%	5.0%	0.0%	5.0%	5.0%	5.0%	0.0%	0.0%	0.00	0.78	0.00	0.78	0.78	0.78	0.00	0.00	3.13
#135 Elite Wate	9.6	0.0970	4.00	0.0%	5.0%	0.0%	2.0%	2.0%	5.0%	0.0%	0.0%	0.00	0.82	0.00	0.33	0.33	0.82	0.00	0.00	2.28
#102 Heresite S	6.71	0.0970	4.00	0.0%	0.0%	0.0%	2.0%	1.0%	0.0%	0.0%	0.0%	0.00	0.00	0.00	0.23	0.11	0.00	0.00	0.00	0.34
												0.00	0.76	0.00	**0.78**	**0.78**	0.08	0.00	0.00	**3.13**

* Determine Potential HAPs at Limited PTE: 249 tons VOC/yr x yr/292.31 tons VOC x 32.6 ton HAP = 27.77 tons HAP
State Potential Emissions based upon worst case HAP loading and 8,760 hr/yr.

METHODOLOGY
HAPS emission rate (tons/yr) = Density (lb/gal) * Gal of Material (gal/unit) * Maximum (unit/hr) * Weight % HAP * 8760 hrs/yr * 1 ton/2000 lbs

Appendix A: Emissions Calculations
VOC and Particulate
From Surface Coating Operations

Company Name: Horner Electric
Address City IN Zip: 1521 East Washington Street, Indianapolis, Indiana 46201
Permit No.: T097-7787-00301
Vent ID: Emission Unit #6 (EU6)
Reviewer: K Leone
Date: December 1998

	PM	PM-10	SO2	NOx	CO	VOC	HAPS Single	HAPS Combination
Paint Booth EU-17	1.68	1.68	0	0	0	11.40	0.78	3.13
Insignificant	0.00	0.00	0	0	0	0.00	0.00	0.00
Total Emissions	1.68	1.68	0	0	0	11.40	0.78	3.13

Appendix A: Emission Calculations

Abrasive Blasting

Company Name: Horner Electric
Address City IN Zip: 1521 East Washington Street Indianapolis, Indiana 46201
Reviewer: Kevin Leone
Date: December 1998

Table 1 - Emission Factors for Abrasives

	Emission Factor	
Abrasive	PM / lb abrasive	PM10 / lb PM
Sand	0.041	0.70
Grit	0.010	0.70
Steel Shot	0.004	0.86
Other	0.010	

Table 2 - Density of Abrasives (lb/ft3)

Abrasive	Density (lb/ft3)
Al oxides	160
Sand	99
Steel	487

Table 3 - Sand Flow Rate (FR1) Through Nozzle (lb/hr)

Flow rate of Sand Through a Blasting Nozzle as a Function of Nozzle pressure and Internal Diameter

	Nozzle Pressure (psig)							
Internal diame	30	40	50	60	70	80	90	100
1/8	28	35	42	49	55	63	70	77
3/16	65	80	94	107	122	135	149	165
1/4	109	138	168	195	221	255	280	309
5/16	205	247	292	354	377	420	462	507
3/8	285	355	417	477	540	600	657	720
7/16	385	472	560	645	755	820	905	940
1/2	503	615	725	835	945	1050	1160	1265
5/8	820	990	1170	1336	1510	1680	1850	2030
3/4	1140	1420	1670	1915	2160	2400	2630	2880
1	2030	2460	2900	3340	3780	4200	4640	5060

Calculations

Adjusting Flow Rates for Different Abrasives and Nozzle Diameters

Flow Rate (FR) = Abrasive flow rate (lb/hr) with internal nozzle diameter (ID)	
FR1 = Sand flow rate (lb/hr) with internal nozzle diameter (ID1) From Table 3 =	221
D = Density of abrasive (lb/ft3) From Table 2 =	155
D1 = Density of sand (lb/ft3) =	99
ID = Actual nozzle internal diameter (in) =	0.25
ID1 = Nozzle internal diameter (in) from Table 3 =	0.25

Flow Rate (FR) (lb/hr) = **346.010** per nozzle

Uncontrolled Emissions (E, lb/hr)

EF = emission factor (lb PM/ lb abrasive) From Table 1 =	0.010
FR = Flow Rate (lb/hr) =	346.010
w = fraction of time of wet blasting =	0 %
N = number of nozzles =	1

Uncontrolled Emissions =	**3.46 lb/hr**
	15.16 ton/yr

METHODOLOGY

Emission Factors from Stappa Alapco, Section 3 "Abrasive Blasting"
Ton/yr = lb/hr X 8760 hr/yr X ton/2000 lbs
Flow Rate (FR) (lb/hr) = FR1 x (ID/ID1)2 x (D/D1)
E = EF x FR x (1-w/200) x N

EU4 - Degreaser

Degreaser		Usage	Density	Precent	Potential VOC Emissions	
Substance		gal/day	lb/gal	VOC by Wt.	lbs/day	tons/yr
Trichloroethylene		12	12.18	100.00%	146.16	26.67

EU 7 - Varnish Tank #1

	lb VOC/gallon	gallons/year	lb VOC/year	ton VOC/year	ton HAP/year
Thermopoxy	4.42	220	972	0.49	
Xylene	7.18	57	272.8	0.14	0.14
Totals		277	1244.8	0.63	0.14

EU 8 - Varnish Tank #2

	lb VOC/gallon	gallons/year	lb VOC/year	ton VOC/year	ton HAP/year
Sterling	3.59	110	395	0.2	
Xylene	7.18	19	136	0.07	0.07
Totals		129	531	0.27	0.07

Both	0	406	1775.8	0.9	0.21

EU 9 - VPI Tank #1

	lb VOC/gallon	gallons/year	lb VOC/year	ton VOC/year
709A	3.8	1,930	7334	3.6
Totals		1,930	7334	3.6

EU 10 - VPI Tank #2

	lb VOC/gallon	gallons/year	lb VOC/year	ton VOC/year
709A	3.8	1,930	7334	3.6
Totals		1,930	7334	3.6

both	0	3860	14668	7.2

Stack gas conversions

S/V ID	Stack flow rate in scfm or cfm	Stack gas temp	acfm
1	300	1100	883.0189
2	390	1500	1442.264
3	100	70	100
4	500	450	858.4906
5	750	500	1358.491
6	200	500	362.2642
7	19300	70	19300
8	18000	70	18000

add columns as necessary

Sourcewide PTE	PM	PM-10	SO2	NOx	CO	VOC	HAPS Single	HAPS Combination
Paint Booth	1.68	1.68	0.00	0.00	0.00	11.40	0.78	3.13
Sandblaster	15.16							
Degreaser						26.67	26.67	26.67
Varnish Tanks						0.9	0.21	
VPI Tanks						7.2		
Total	16.84	1.68	0.00	0.00	0.00	46.18	27.67	29.80

Appendix A: Emissions Calculations
VOC and Particulate
From Surface Coating Operations

Company Name: Horner Electric
Address City IN Zip: 1521 East Washington Street, Indianapolis, Indiana 46201
Permit No.: T097-7787-00301
SIC: 3621 **Vent ID:** Emission Unit #6 (EU6)
Reviewer: K Leone
Date: December 1998

Potential to Emit (PTE)

Material	Density (Lb/Gal)	Weight % Volatile (H20& Organics)	Weight % Water	Weight % Organics	Volume % Water	Volume % Non-Vol (solids)	Gal of Mat (gal/unit)	Maximum (unit/hour)	Pounds VOC per gallon of coating less water	Pounds VOC per gallon of coating	Potential VOC pounds per hour	Potential VOC pounds per day	Potential VOC tons per year	Particulate Potential ton/yr	lb VOC /gal solids	Transfer Efficiency
#126 Heresite EP-6300 Coating	9.20	53.5%	0.0%	53.5%	0.0%	48.0%	0.0970	4.00	4.92	4.92	1.91	45.83	8.36	1.82	10.25	75%
#135 Elite Water Based Primer	9.60	55.0%	57.0%	55.0%	57.0%	67.0%	0.0970	4.00	5.03	5.28	2.05	49.17	8.97	1.84	7.88	75%
#102 Heresite S-330 Solvent	6.71	100.0%	0.0%	100.0%	0.0%	0.0%	0.0970	4.00	5.85	6.71	2.60	62.48	11.40	0.00	ERR	75%
t case coating, maximum units per hour and 8,760 hours/yr.											**2.60**	**62.48**	**11.40**	**1.68**		

(1) Data from Mfr's sheet

METHODOLOGY

Pounds of VOC per Gallon Coating less Water = (Density (lb/gal) * Weight % Organics) / (1-Volume % water)
Pounds of VOC per Gallon Coating = (Density (lb/gal) * Weight % Organics)
Potential VOC Pounds per Hour = Pounds of VOC per Gallon coating (lb/gal) * Gal of Material (gal/unit) * Maximum (units/hr)
Potential VOC Pounds per Day = Pounds of VOC per Gallon coating (lb/gal) * Gal of Material (gal/unit) * Maximum (units/hr) * (24 hr/day)
Potential VOC Tons per Year = Pounds of VOC per Gallon coating (lb/gal) * Gal of Material (gal/unit) * Maximum (units/hr) * (8760 hr/yr) * (1 ton/2000 lbs)
Particulate Potential Tons per Year = (units/hour) * (gal/unit) * (lbs/gal) * (1- Weight % Volatiles) * (1-Transfer efficiency) *(8760 hrs/yr) *(1 ton/2000 lbs)
Pounds VOC per Gallon of Solids = (Density (lbs/gal) * Weight % organics) / (Volume % solids)
Total = Worst Coating + Sum of all solvents used

Transfer efficiency was estimated at 75% for flat surface work and electrostatic air atomized, per "Air Pollution Engineering Manual" (AP-40), Table 2, page 362, 1992 edition.

Appendix A: Emissions Calculations
HAP Emission Calculations
From Surface Coating Operations

Company Name: Horner Electric
Address City IN Zip: 1521 East Washington Street, Indianapolis, Indiana 46201
Permit No.: T097-7787-00301
Vent ID: Emission Unit #6 (EU6)
Reviewer: K Leone
Date: December 1998

Material	Density (Lb/Gal)	Gal of Mat (gal/unit)	Maximum (unit/hour)	Weight % 2-Butoxyethanol (glycol ether)	Weight % Methyl Ethyl Ketone	Weight % Glycol Ethers	Weight % Toluene	Weight % Xylene	Weight % Methyl Isobutyl Ketone	Weight % Benzene	Weight % Ethylbenzene	2-Butoxyeth-onal (ton/yr) (glycol ether)	Methyl Ethyl Ketone (ton/yr)	Glycol Ethers (ton/yr)	Toluene (ton/yr)	Xylene (ton/yr)	Methyl Isobutyl Ketone (ton/yr)	Benzene (ton/yr)	Ethylbenzene (ton/yr)	Total Potential per coating (tons/yr)
#126 Heresite E	9.2	0.0970	4.00	0.0%	5.0%	0.0%	5.0%	5.0%	5.0%	0.0%	0.0%	0.00	0.78	0.00	0.78	0.78	0.78	0.00	0.00	3.13
#135 Elite Wate	9.6	0.0970	4.00	0.0%	5.0%	0.0%	2.0%	2.0%	5.0%	0.0%	0.0%	0.00	0.82	0.00	0.33	0.33	0.82	0.00	0.00	2.28
#102 Heresite S	6.71	0.0970	4.00	0.0%	0.0%	0.0%	2.0%	1.0%	0.0%	0.0%	0.0%	0.00	0.00	0.00	0.23	0.11	0.00	0.00	0.00	0.34
												0.00	0.76	0.00	**0.78**	**0.78**	0.08	0.00	0.00	**3.13**

* Determine Potential HAPs at Limited PTE: 249 tons VOC/yr x yr/292.31 tons VOC x 32.6 ton HAP = 27.77 tons HAP
State Potential Emissions based upon worst case HAP loading and 8,760 hr/yr.

METHODOLOGY
HAPS emission rate (tons/yr) = Density (lb/gal) * Gal of Material (gal/unit) * Maximum (unit/hr) * Weight % HAP * 8760 hrs/yr * 1 ton/2000 lbs

Appendix A: Emissions Calculations
VOC and Particulate
From Surface Coating Operations

Company Name: Horner Electric
Address City IN Zip: 1521 East Washington Street, Indianapolis, Indiana 46201
Permit No.: T097-7787-00301
Vent ID: Emission Unit #6 (EU6)
Reviewer: K Leone
Date: December 1998

	PM	PM-10	SO2	NOx	CO	VOC	HAPS Single	HAPS Combination
Paint Booth EU-17	1.68	1.68	0	0	0	11.40	0.78	3.13
Insignificant	0.00	0.00	0	0	0	0.00	0.00	0.00
Total Emissions	1.68	1.68	0	0	0	11.40	0.78	3.13

Appendix A: Emission Calculations

Abrasive Blasting

Company Name: Horner Electric
Address City IN Zip: 1521 East Washington Street Indianapolis, Indiana 46201
Reviewer: Kevin Leone
Date: December 1998

Table 1 - Emission Factors for Abrasives

	Emission Factor	
Abrasive	PM / lb abrasive	PM10 / lb PM
Sand	0.041	0.70
Grit	0.010	0.70
Steel Shot	0.004	0.86
Other	0.010	

Table 2 - Density of Abrasives (lb/ft3)

Abrasive	Density (lb/ft3)
Al oxides	160
Sand	99
Steel	487

Table 3 - Sand Flow Rate (FR1) Through Nozzle (lb/hr)

Flow rate of Sand Through a Blasting Nozzle as a Function of Nozzle pressure and Internal Diameter

	Nozzle Pressure (psig)							
Internal diame	30	40	50	60	70	80	90	100
1/8	28	35	42	49	55	63	70	77
3/16	65	80	94	107	122	135	149	165
1/4	109	138	168	195	221	255	280	309
5/16	205	247	292	354	377	420	462	507
3/8	285	355	417	477	540	600	657	720
7/16	385	472	560	645	755	820	905	940
1/2	503	615	725	835	945	1050	1160	1265
5/8	820	990	1170	1336	1510	1680	1850	2030
3/4	1140	1420	1670	1915	2160	2400	2630	2880
1	2030	2460	2900	3340	3780	4200	4640	5060

Calculations

Adjusting Flow Rates for Different Abrasives and Nozzle Diameters

Flow Rate (FR) = Abrasive flow rate (lb/hr) with internal nozzle diameter (ID)	
FR1 = Sand flow rate (lb/hr) with internal nozzle diameter (ID1) From Table 3 =	221
D = Density of abrasive (lb/ft3) From Table 2 =	155
D1 = Density of sand (lb/ft3) =	99
ID = Actual nozzle internal diameter (in) =	0.25
ID1 = Nozzle internal diameter (in) from Table 3 =	0.25

Flow Rate (FR) (lb/hr) = **346.010** per nozzle

Uncontrolled Emissions (E, lb/hr)

EF = emission factor (lb PM/ lb abrasive) From Table 1 =	0.010
FR = Flow Rate (lb/hr) =	346.010
w = fraction of time of wet blasting =	0 %
N = number of nozzles =	1

Uncontrolled Emissions =	**3.46 lb/hr**
	15.16 ton/yr

METHODOLOGY

Emission Factors from Stappa Alapco, Section 3 "Abrasive Blasting"
Ton/yr = lb/hr X 8760 hr/yr X ton/2000 lbs
Flow Rate (FR) (lb/hr) = FR1 x (ID/ID1)2 x (D/D1)
E = EF x FR x (1-w/200) x N

EU4 - Degreaser

Degreaser		Usage	Density	Precent	Potential VOC Emissions	
Substance		gal/day	lb/gal	VOC by Wt.	lbs/day	tons/yr
Trichloroethylene		12	12.18	100.00%	146.16	26.67

EU 7 - Varnish Tank #1

	lb VOC/gallon	gallons/year	lb VOC/year	ton VOC/year	ton HAP/year
Thermopoxy	4.42	220	972	0.49	
Xylene	7.18	57	272.8	0.14	0.14
Totals		277	1244.8	0.63	0.14

EU 8 - Varnish Tank #2

	lb VOC/gallon	gallons/year	lb VOC/year	ton VOC/year	ton HAP/year
Sterling	3.59	110	395	0.2	
Xylene	7.18	19	136	0.07	0.07
Totals		129	531	0.27	0.07

Both	0	406	1775.8	0.9	0.21

EU 9 - VPI Tank #1

	lb VOC/gallon	gallons/year	lb VOC/year	ton VOC/year
709A	3.8	1,930	7334	3.6
Totals		1,930	7334	3.6

EU 10 - VPI Tank #2

	lb VOC/gallon	gallons/year	lb VOC/year	ton VOC/year
709A	3.8	1,930	7334	3.6
Totals		1,930	7334	3.6

both	0	3860	14668	7.2

Stack gas conversions

S/V ID	Stack flow rate in scfm or cfm	Stack gas temp	acfm
1	300	1100	883.0189
2	390	1500	1442.264
3	100	70	100
4	500	450	858.4906
5	750	500	1358.491
6	200	500	362.2642
7	19300	70	19300
8	18000	70	18000

add columns as necessary

Sourcewide PTE	PM	PM-10	SO2	NOx	CO	VOC	HAPS Single	HAPS Combination
Paint Booth	1.68	1.68	0.00	0.00	0.00	11.40	0.78	3.13
Sandblaster	15.16							
Degreaser						26.67	26.67	26.67
Varnish Tanks						0.9	0.21	
VPI Tanks						7.2		
Total	16.84	1.68	0.00	0.00	0.00	46.18	27.67	29.80